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## WHAT ARE YOU WORTH?


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(Address of the President before the Arizona State Medical Association, at its Fortieth Annual Meeting, held in Nogales, Ariz., May 7-9, 1931.)

"Let him who would be greatest among you, be servant of all." Love and service will win, or I will fail.

I cannot fully express my thanks for the honor which you have bestowed upon me. The honor of being president of a state medical association is one that should spur the ambition of every member in our profession to put forth his best effort to advance medical science. Every man owes something to the profession to which he belongs. The physician, above all men, has a rich heritage. Remember the illustrious names of the great heroes of medicine. Not one of them had the skill of the average physician of this day; and yet each one added something of value to the sum total of human knowledge in the great art and science of medicine. By concentrated thought and untiring effort, we can leave the world of medicine a little richer than when we stepped upon the stage. It may be that the curtain will lift but a brief time, but if we play the part well, we may leave the stage with a smile, "and lie down to pleasant dreams."

The unsolved problems now before the medical profession are so numerous, and of such magnitude, as to challenge the best brains of the world. In no field of human endeavor has greater progress been made, and yet we stand on the shore of the unbounded ocean of truth, and try to grasp the meaning of the Great Physician's words: "Ye shall know the truth, and the truth shall make you free." (John, 8-22.) How much the human race wishes to be free from the handicaps of disease, from sickness, pain and death! How much? No human tongue can tell. When the Master said: "Greater works than these shall ye do," He meant exactly what He said. He had healed a few sick folk, but every great hospital in the world has been erected by Christian hands and money, and millions of sick children have been relieved and lifted up, since He walked the shores of Galilee. "Ye shall know the truth, and the truth shall make you free." "And Pilate saith unto Him: 'What is truth?' And when he said this, he went out again unto the Jews" (John, 18-33). We have no record that this question was ever answered. The Master Mind of all centuries might have said: "Pilate, the answer to your question will evolve like the unfolding of a great and beautiful flower, with the passing of all time; but will never be fully answered until time unveils eternity."

At the very beginning of the reign of reason, man began to ask questions: "What am I? Where am I? Where am I going?" Another generation came, and another, and another, and man said: "Why does the apple fall to the ground? Why does the sun rise in the east and set in the west?" Questioning, thinking, reasoning, investigating, discovering, exploring; thus, came the light of civilization, and the unfolding of truth. Little by little, man became free. He was a slave to darkness; he pressed a button, and his home was flooded with light. He was earthbound, a worm of the dust; he said to

the birds: "How do you fly?" He discovered how. The truth has made him free. He wings his way across the seas. He flies above the clouds.

Men were dying from contagious diseases so rapidly a few centuries ago that their bodies were buried in trenches or pits. The driver of the dead wagon drove through the streets crying: "Bring out your dead. Bring out your dead." Truth unfolded and men were free. But, as soon as they were free from one epidemic, they turned to fight another. Truth is not all discovered at once. Man's progress is slow. Only a few years ago occurred one of the most fatal epidemics of influenza that the world has ever known. About ten millions died throughout the world in one winter. Its prevention is not yet discovered.

Smallpox is preventable, yet epidemic follows epidemic, year after year. Why should a health officer isolate and quarantine smallpox? Vaccination prevents, and if not quarantined, many more accept vaccination. Why should we try to protect men who make no effort to protect themselves?

Typhoid is preventable, and yet every community cares for typhoid cases when they are unable to care for themselves. One family of six was given hospital care in Yuma County for several weeks at an expense of eighteen dollars per day. They drank ditch water. Many were fed while quarantined for smallpox. They refused vaccination. Are these people good American citizens? A good citizen will make some effort to protect himself that he may not be a public nuisance. Epidemic meningitis is another challenge. Dr. Roscoe R. Spencer won his gold medal on his work with "Rocky Mountain Spotted Fever." Are you winning your medal? You may do less, and yet do an important work.

Specific therapy is one of the most brilliant and effective results of scientific investigation, and is one of the most valuable means the physician has for combating infections. Bacterial vaccines are antigens used to stimulate the body cells to the formation of an antitoxin. Good seed in good soil brings forth an abundant crop of toxin-producing bacteria; but good seed in poor soil may grow very weakly, if at all. Immunization makes the soil unfavorable. At the present time we are able to immunize against smallpox, rabies, typhoid, diphtheria and tetanus.

Immunology is in its infancy, and the field is open for further research. Who will be the next to inscribe his name in the Hall of Fame? The horse is not the only animal that is able to evolve antitoxin; and the blood serum may not be the only body fluid forming antibodies. Who has tested the lymph, the spinal fluid, and the secretions from the endocrine glands for their protective powers?

If I were the manager of a research laboratory, with money to spend, I would have a whole zoo of animals for experimental purposes. There is an animal somewhere that is able to elaborate an antitoxin for tuberculosis, in response to repeated injections of tuberculin, but the horse is not the animal. The noble horse has done his share, and I would gladly unveil a monument erected to his memory for what he has done for the babies of the world. Should the horse claim all the glory? What is wrong with the Missouri mule, or the Arizona burro? Have they no "biochemical laboratories" underneath their mangy hides?

I wish that each of you might take inventory of your medical knowledge today, at the very beginning of this three-day session, and another inventory at the end of the session, and see how much you gain in the knowledge of your chosen profession. You owe it to yourselves and to those you serve, to attend every session and to be a good listener. Take the convention seriously, for your job is a man's job and your business is a serious business.

The Committee on Scientific Work began to function shortly after last year's convention, and every man whose name appears on this year's program has been selected with great care. Remember that these men are giving to you the best thoughts of their brains, the accumulated knowledge of experience and research. Many of them have spent months in the preparation of their discourses and have traveled from afar to lay before this body of scientific men the results of their investigations. We owe it to them and to ourselves to be present at every scientific meeting, to listen attentively, and to speak respectfully.

Will you go back to your home a better man? Will you delve deeper into the mysteries of the degenerative diseases of old age? Will you tell us how to stop an epidemic of measles?

The great question is not: "How much is your bank account in dollars and cents?" But, the greater question is: "What are you worth to your community?"

What are you worth?

# PYELECTASIS (HYDRONEPHROSIS) AND URETERECTASIS: CAUSES AND TREATMENT

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(Read before the Sixteenth Annual Meeting of the Medical and Surgical Association of the Southwest, held at El Paso, Texas, Nov. 6-8, 1930.)

Reading of the causes of hydronephrosis, one is impressed with the emphasis placed on the obstruction to the outflow of urine. In fact, the general consensus of opinion seems to be that such obstruction is the prime and practically the only cause; and malpositions of the kidney, apparent and real narrowings of the ureter, and the presence of aberrant vessels—all presumed to cause obstruction—occupy the entire field devoted to the etiology, furthering the thought that mechanical obstruction to the outflow of urine and pyelectasis are synonymous. Yet the practical working urologist sees many cases in which none of these lesions is demonstrable but in which marked dilatation of the ureter and pelvis exist.

The principal means of correction advocated for the past four decades have been nephropexy, and the proof of the permanent lack of success has been the various methods of the various surgeons, each claiming that the lack of permanent success was due to a faulty technic, and each inventing a newer operation to fix the kidney. Because of the lack of lasting success by any method, new means of attack gradually came into vogue. Here, the writer takes occasion to say that, while he believes nephropexy to have its indications for certain conditions which may or may not co-exist with hydronephrosis, yet it must not be considered a remedy for the hydronephrosis.

Hunner's[1] idea that stricture of the ureter was a very frequent cause of this condition, came close to hitting the mark, and many of these ureters have been dilated with large sized bougies, with a goodly percentage of relief where the stricture could be demonstrated, and with a small percentage of success even in those cases where a stricture could not be shown to exist. However, he failed to take into earnest consideration the concomitant lesions which were the cause of the stricture as well as the hydronephrosis, even though his writing shows that he was probably aware of such conditions.

Tying off and cutting of aberrant vessels over which a ureter pouched itself, dropped into disrepute when it became evident that this procedure was virtually a partial nephrectomy, and it was supplanted by cutting the ureter and re-uniting it on the other side of such vessel. Resection of the enlarged pelvis enjoyed but a very short popularity because such pelvis again became dilated.

And so, the entire subject remains in an unsettled state, with a total permanent success by any form of treatment so small that many urologists of experience are beginning to feel that this condition should not be treated surgically unless it can be demonstrated that the kidney function of the hydronephrotic kidney, in those cases where only one kidney is affected, is so reduced, and the symptoms and sufferings so marked, that nephrectomy becomes justifiable.

That we may arrive at a better understanding of the pathology, let us consider what precedes it. To begin with, almost all processes of inflammation anywhere in the body are frequently accompanied by attacks of pyelitis. It is agreed, now, that pyelitis, per se, is not an entity; that the condition is pyelonephritis, the nephritis being the primary lesion in the uropoietic system.

Such pyelitis and ureteritis mean, of course, an invasion of the wall of the pelvis and ureter by bacteria. Damage to the musculature of this canal (for the pelvis is but a dilated end of the ureteral canal), damage to the ganglion cells and sympathetic nerve supply which innervate the ureter, and damage to the submucous connective tissue, follow. Nature attempts to wall off this invasion of bacteria in the various coats of the ureter and pelvis with the production of fibrous tissue, and thus still further damages this muscular tube and its innervation. Once the kidney has been infected, this pathway remains open, and each new infection of any portion of the body may produce a new nephritis and pyelitis, further damage ensuing. All this is peculiar to, although not entirely confined to, the period of infancy, youth, and early adult life. Late adult life and old age have their own troubles through ascending infections from the lower urinary and genital tracts, the same damage being done to the ureter, pelvis and kidney.

We come now to the definition or, rather, description, of what occurs with an inflammation of the kidney. The kidney is a highly complex organ, consisting of a few million entirely separate excretory systems, each such component system containing a glomerulus, proximal convoluted tubule, loop of Henle, and distal convoluted tubule. The collecting tubule, judging from its embryology, is probably not a working portion of this system, but merely the extension of the calyces. These various systems, each having its own blood supply, are bound together by fibrous tissue. When infection occurs

through the blood stream, damage is done to the vessels of the kidney, the vasa afferentia being the heaviest sufferers, the tunica intima and tunica media sustaining the greatest damage. The epithelium of Bowman's capsule, as well as that of the tubules, the epithelium of the blood vessels within the glomeruli, as well as those coming to and leaving this structure, all suffer. And this process is ended, in the event of recovery, by a replacement fibrosis. To be sure, the damage varies with the amount of virulence and the location of the infection, and the end result and total amount of harm done depend upon such virulence and the amount of tissue involved. Not infrequently, the virulence is so great that miliary abscesses form within the kidney, these having been most commonly noted subcortically. Most enlightening is the work of Dorothy Russell[2] on this subject, as well as that by J. P. Simonds[3].

Perinephritis, peripyelitis and periureteritis are next in order, the fat surrounding these structures becoming infected by extension. He who has had occasion to remove tuberculous kidneys can vouch for this condition, this lesion sometimes being so well developed that an intracapsular extirpation is the only possible way of removing such kidney. The natural result of this process is a firm fixation of the kidney, its pelvis and ureter, because of the replacement fibrosis, nature's attempt at arrest.

The normal kidney, in its loose bed of perinephritic fat, has a free movement with respiration of from three to five centimeters[4]. Such movement of the kidney, its pelvis and loosely attached upper ureter, also occurs with the assumption of the upright position. With the advent of perinephritis, these structures become fixed in a bed of fibrous tissue which no longer permits such free movement, thus preventing the proper expansion of the kidney within its capsule, and interfering with free peristalsis. The musculature of the pelvis and upper ureter is badly impaired, as stated above, and the autonomic nerve supply is damaged. It is no wonder, then, that the pelvis and the ureter dilate. With this dilatation, this tube elongates itself, because the muscular coat has a longitudinal as well as a circular layer. Thus, such dilatation not only broadens the pelvis and ureter, but elongates these structures. The length of the ureter is always greater than the distance from the kidney to the bladder, and when its length is increased, it is compelled to kink itself. As may be seen, the kink is not the cause of the trouble, but the result, and the correction of such kinking as a method of cure of the condition would be illogical. The pelvis, when dilated, would naturally fold itself over an aberrant vessel, and, therefore, neither the tying of the aberrant vessel nor the section and reunion of the ureter on the other side of such aberrant vessel would, in any way, help the pathology which is going on. The aberrant vessel was not the cause of the condition, but the dilatation of the pelvis was its cause. It must not be forgotten that this aberrant vessel existed from the beginning, and did not cause trouble until the dilatation of the pelvis as a result of the inflammatory process mentioned above[5].

Again, if there be no perinephritis to fix the kidney, but if a marked hydronephrosis occur, this, together with the additional weight of the kidney, both as a result of increased tissue as well as the weight of the fluid contained in the enlarged pelvis, would cause a dropping of the kidney, particularly if the enlargement were so marked that the entire organ became too big to fit into the kidney notch. It must not be forgotten that nothing holds the kidney in place except intra-abdominal pressure, and the shape of the kidney and its notch; and that as above stated, the kidney moves up and down normally. In such event, logically, the nephroptosis would not have been the cause of the hydronephrosis, but, conversely, the hydronephrosis would have been the cause of the nephroptosis. Therefore, restoring the kidney to its original position would in no way help such pyelectasis, inflammatory changes being the cause of the condition and its ensuing symptoms. We very often see all degrees of movable kidney unaccompanied by any sort of symptom, its possessor unaware of the fact that the kidney is movable.

Considering again the changes which occur as the result of infection, it may be seen from the pathology that a damaged kidney function is one of the results. Such damage may be so minimal that no symptoms appear, and this is probably the case most often with these attacks of nephritis. It is also true that the damage done to one kidney may be much greater than such damage on the other side, and this explains why, at times, hydronephrosis is unilateral. Nevertheless, both kidneys are probably always infected by such blood-borne infection, and it is not infrequent to see pyelectasis on one side and atresia due to fibrosis in the pelvis of the other side.

What may we hope to do for these sufferers? We can not completely restore the integrity of the kidney, nor is this demanded of us, because the kidney is capable of much

more work than ever is required of it, even under stress. Occasionally, however, the damage to the kidney is so great that the patient suffers not only from the anatomic changes at and about the kidney capsule, pelvis and ureter, but also from the impaired kidney function, and it is the belief of the writer that in these cases something may be done to partially restore the function of the kidney. With the accomplishment of this, the task of relieving the symptoms caused by the anatomic changes in and about the kidney, pelvis and ureter, and the kidney itself, comes into consideration. Accomplishing this, a virtual restoration to normal, as far as the patient knows, is secured.

Such result is not to be gained by fixing an already fixed kidney, pelvis and ureter, but rather by freeing the kidney, its pelvis and ureter, from the adhesions which bind it, and thus restoring the normal motion of these structures, and permitting the free muscular action of the latter two. When a nephropexy has given temporary relief for hydronephrosis, such relief was not accomplished by the fixation of the kidney in a certain position, but rather as the result of the nephrolysis, pyelolysis and ureterolysis incident to the procedure. In plain language, by freeing of the kidney, its pelvis and ureter, from the surrounding fibrosis. The fixing of the kidney probably encourages the early return of the fibrosis and accounts for the lack of duration of the relief. The nephrolysis, pyelolysis and ureterolysis being accomplished, there remains but the improvement of the function. Decapsulation of the kidney permits of freer circulation within this organ, and thus the function is increased. Decapsulation of one normal kidney, in dogs, increases the function of this kidney, naturally with the decrease of the function of the other normal kidney, as proved by some yet unpublished work by the writer. The well-known work of Edebohls has quite conclusively demonstrated such increased function, in the human, in nephritis. This is so well accepted that the decapsulation of the kidney is a sort of last resort in severe uremia, the results being startling, especially when the patient is in extremis.

Concisely put, for hydronephrosis, where operative interference is indicated, free the kidney by decapsulation, thus increasing its function, free the pelvis and the ureter.

The localized pain will be found to have disappeared, the patient's weight will increase, digestive disturbances and headaches, general malaise and loss of weight will, in the carefully selected cases, have been found to have disappeared, and the result is usually gratifying.

Where the function of the hydronephrotic kidney has been assumed to a great extent by its fellow, so that, to put it arbitrarily, the diseased organ is accomplishing, as far as we may judge by functional tests, less than one-quarter of the entire work, nephrectomy is indicated. It would be too much to hope that decapsulation would do much toward restoration of function in so badly damaged an organ.

There is a class of cases, both kidneys being hydronephrotic, in which no treatment of any kind, whether surgical or otherwise, is indicated. These are the cases in which the hydronephrosis is of neurogenic origin. Whether the lesion be in the central nervous system or be peripheral, little is to be hoped for, in the present state of our knowledge, by any form of treatment. Whether the lesion be central or peripheral, very generally the condition is bilateral, and the motor function of the bladder is likewise damaged.

This residual urine in the bladder, together with the symmetrical pyelectasis and ureterectasis, gives us our cue to the diagnosis. However, it is conceivable that this may be unilateral, and that the bladder involvement may either be slight or absent, in which event considerable difficulty might be found in making such a diagnosis. As above stated, once such diagnosis is made, all forms of local treatment, whether operative or otherwise, are contra-indicated. Treatment directed against the lesion of the nervous system, especially when the cause is lues, is indicated.

Of hydronephrosis caused by the accidental ligation of the ureter incident to abdominal operation, the writer cannot speak of his own experience, never having come in contact with such a case. Judging by the paucity of case reports, such accidents must be rare.

The treatment depends, then, on the amount of suffering the possessor of this condition is called upon to endure, and on a careful study as to the cause of the condition, as well as whether the results of such treatment justify the means adopted to relieve the patient. Since hydronephrosis exists, at times, without any morbidity worth mentioning, such cases are best left alone if the treatment in any way endanger life. If stricture of the ureter can be demonstrated, as is frequently the case, it will be found that dilatation of such stricture will, in a large percentage of cases, give results

that are brilliant. If violent or long enduring pain, with loss of weight, and gastro-intestinal symptoms rule the picture, operative interference is indicated. Great care must be exhibited in attributing abdominal pain and gastro-intestinal symptoms to kidney lesions, even when such kidney lesions exist, or failure will result. Such operative interference should consist of decapsulation of the kidney, with pyelolysis and ureterolysis, or, in the event of a non-functioning or low-functioning kidney, nephrectomy, providing the other kidney is capable.

SUMMARY

1. There are three causes given for hydronephrosis, the overwhelming one being infection. Lesions of the central or peripheral nervous system are comparatively rare, and the accidental ligation of a ureter is extremely rare.

2. Such infection involves, where hydronephrosis is the result, not only the kidney, but the walls of the pelvis and ureter as well, and is accompanied by a paranephritis or perinephritis.

3. Nephropexy has its indications, but is not a therapeutic measure to be used against hydronephrosis.

4. Treatment should consist of dilatations of the ureters: if results are obtained, nothing further is necessary. Failure by this means involves a reconsideration of the case to determine whether operative interference is justifiable.

5. Operative interference should consist of either a decapsulation of the kidney, with a freeing of the pelvis and ureter, or nephrectomy.

6. Hydronephrosis of neurogenic origin should have no form of treatment directed against the kidney condition, but, rather, treatment for the neurologic lesion, and careful study should be made of each case in order to exclude such cases.

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## TREATMENT OF BURNS

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The importance of a satisfactory treatment for burns is apparent upon recognition of the high mortality, the prolonged morbidity, and the permanent deformities that accompany this type of injuries.

Child mortality is yearly augmented by burns. Statistics compiled by the Metropolitan Life Insurance Company[1] reveal that 45 per cent of the lethal burns occurring annually in the United States are in children under six years of age. In adults, the mortality is lower. Every industrial surgeon, however, has observed scores of men incapacitated for weeks by burns—a tremendous economic loss. Deformities and disfiguring scars resulting from burns not infrequently undermine a patient's psychic equilibrium, transforming a productive citizen into an invalid. Treves and Pack[2] reported thirty-four cases of carcinoma developing in burn scars, and Strauss[3] has reported similar cases—tragic sequelae of inadequate treatment.

ETIOLOGY AND INCIDENCE

In the Children's Hospital of Michigan, it was found[4] that 62 per cent of burns were due to somoene's leaving a pail of hot water unprotected, filling a tub with hot water and allowing the child to fall into it, or permitting a child to pull a kettle of hot water, soup, or coffee, from a stove, spilling the contents over itself.

The second important etiological agent in causing burns in children is playing with matches or around a bonfire. This suggests that more than 60 per cent of the mortality and morbidity of burns in children is definitely avoidable, and is due to carelessness in adults. In Great Britain there is a law mkaing it a punishable offense to leave a child under seven years of age in the room with an unprotected fire[4].

In adults, statistics as to etiology are not available. Industrial burns, frequently caused by chemicals, concern us in El Paso, an industrial center. Apparently, the incidence of burns is on the decrease, due, no doubt, to improved methods of prevention. In one large London hospital, in the period from 1899 to 1903, there were 990 cases admitted, with 251 deaths as contrasted with the period 1924 to 1928, when 286 cases were admitted, and only 19 died.

On the basis of mortality statistics[5], females seem to be affected more than males, in the ratio of 3 to 2. More boys than girls die of burns during the first three years of life. From the fourth year upward, however, a relatively higher death rate is found

in girls, increasing until, at the age of nine, twice as many girls as boys die from this cause. Up to the age of 35, females predominate, then males and females are about equally affected for a number of years. Later, in old age, more females than males are again found burned. Doubtless the preponderance of fatalities among women may be explained by the character of clothing worn and by the difference in occupation. More burns occur in the winter than in the summer months.

PROGNOSIS

The prognosis in case of a burn must be dependent upon surface involved and depth of tissue affected. Depth of burn is determined by the agent and the duration of its contact with the skin. Underhill[8] has shown that severe burns penetrate skin and superficial tissues, injuring underlying viscera. He submits the resulting pathology as one cause for shock.

It has been said that a child will tolerate a burn of only one-seventh of its body, while an adult may recover from one involving one-third of the total cutaneous surface. Thick skin, as on the palms and soles, offers a greater resistance to heat than do more delicate parts of the body. The skin of a child, thinner, of softer texture and more delicate than on corresponding parts of the adult body, is more severely burned than the adult by the same thermal stimulus. From comparatively slight thermal trauma, there may occur in the child large, deep burns, producing exhaustion, and necessitating skin grafting. In children, therefore, prognosis should be more guarded than in adults.

Acid and alkali burns produce necrosis deeper into the tissues than do scalds or thermal burns. Electricity devitalizes tissue and more prolonged morbidity results. The etiological factor must be considered in forming a prognosis for a burned patient.

PATHOLOGY

In treating an extensive superficial burn, three generally accepted conditions may demand attention: first, shock; second, toxemia; and, third, the wound itself. In addition, Underhill has demonstrated that anhydremia occurs, resulting in marked concentration of the blood. Loss of fluids over burned areas is profuse, due to an increased permeability of the injured capillaries. Under the conditions attending a burn, substances that normally do not pass through the capillary wall are found in the edema fluid. Reabsorption of the fluid, on the other hand, is abnormally slow. Fluids injected by hypodermoclysis into burned areas, are very slowly absorbed. Apparently, capillary permeability in one direction may exist with decreased permeability in the opposite direction.

Animal experiments involving superficial burns over approximately one-sixth of the body, demonstrated that water loss from the blood may reach as high as 70 per cent of the total blood volume. Blood thus concentrated is an inefficient oxygen carrier. Allowed to persist, it produces failing circulation, oxygen starvation of the tissues, a fall in temperature, and finally a suspension of vital activities. Estimation of hemoglobin is a simple but reliable test for blood concentration. It should not be neglected in examining the severely burned patient. Hemoglobin of 125 per cent has reached a dangerous limit; with 140 per cent concentration, the patient cannot long survive.

Underhill pursues this theory so far as to attribute to blood concentration the symptoms usually ascribed to toxemia. He contends that the so-called toxemia is not a toxemia at all; that is, it is not produced by any demonstrable toxin. Toxic symptoms are produced by marked concentration of the blood, and subsequently an inefficient circulation, causing changes in temperature, renal involvement, lowered blood pressure, and other disturbances. Even anatomic changes, such as hemorrhages and ulcers, may be attributed to a single fundamental cause; namely, a change in circulation induced by penetration of heat to the organs or tissues.

At variance with this theory is the heretofore accepted one that burns produce protein decomposition, these products of protein autolysis circulating in the blood stream and causing toxic symptoms. Vogt and Vaccarezza observed that when parabiosis was established between two animals and one was burned, the other showed evidence of toxemia. They demonstrated further that toxic symptoms did not develop in the unburned animal within twelve hours, but that both animals finally died of "toxemia" when left united. Toxic cleavage products of protein decomposition were isolated by Pfeiffer from burned skin. Robertson and Boyd proved the toxicity of products of protein autolysis from burned tissue.

TREATMENT

First degree burns, producing only erythema without vesiculation, require comparatively little treatment. Butesin picrate is an an analgesic ointment which contributes to the patient's comfort. It may be applied with or without gauze dressings.

Second and third degree burns concern us more, for in these cases not the wound

alone, but the patient as well, demands attention.

Clinical and experimental facts suggest that the toxemia which accompanies severe burns might be rationally combated by some form of local treatment which would prevent absorption from the burned area. Various attempts have been made to accomplish this. Debridement enjoyed a period of popularity[7] but has been largely discarded, due to the severity of the procedure. Douglas used adrenalin and procaine in an attempt to prevent absorption.

An ideal treatment for burns must, obviously, (1) stop pain. (2) prevent toxemia, (3) insure asepsis, (4) prevent the loss of tissue fluids, and (5) prevent contractures and scar formation. Application of tannic acid is the treatment which more nearly approaches this ideal.

Tannic acid is an amorphous powder, readily soluble in water. The solution must be freshly prepared, for on standing it deteriorates into gallic acid, which is less astringent. Use of tannic acid as primary treatment for burns was first reported by Davidson[8] in 1925. His method consisted in the use of 2.5 per cent freshly prepared solution of tannic acid, applied on sterile gauze over the wound. Dressings were moistened every hour with this solution, and then carefully removed as soon as the surface was well tanned. A dry, tanned, tough coagulum was formed from the precipitation of protein in the wound by tannic acid. This brown crust was left exposed to air, and no further dressings were applied.

Recent improvement in technic has introduced the spray to replace gauze dressings, as a means of application. We use a motor-driven spray for applying tannic acid to burns, but a simple atomizer will serve.

The severely burned patient should first receive morphine for relief of pain. Fluids should be forced by every available route—saline, glucose and water. From four to eight liters should be administered to an adult within the first 24 hours— the period of greatest loss of fluids. External heat is indicated if symptoms of shock are observed. The importance of forcing fluids, by infusion, proctoclysis, hypodermoclysis, and by mouth, cannot be over-estimated.

Devitalized epithelium and vesicles are stripped away with forceps. If any oily substance has been previously applied, it must be washed off with benzene. Three per cent aqueous solution of tannic acid (some authorities advocate 5 per cent) is sprayed on the burned areas every thirty minutes until a mahogany-brown color is obtained. The color of the coagulum gradually deepens into black. In spraying about the face, the eyes must be protected.

No further dressings are applied. The patient is placed under a tent, where he is kept warm by electric lights under the tent. The heat thus formed aids in drying the coagulum. Tannic acid's analgesic effect is soon apparent, and the patient usually rests comfortably without more opiates. The dry coagulum becomes insensitive to touch. As epithelium forms beneath it, the crust curls at the edges and can be trimmed with scissors. Healing is usually complete in two or three weeks.

Herzfeld[9], who has by this method reduced the mortality at the Royal Edinburgh Hospital for Sick Children from 38 per cent to 9 per cent, summarizes thus the advantages of tannic acid:

(1) It forms a coagulum with the raw surface and thereby decreases absorption of autolyzed proteins.

(2) By forming a potentially waterproof and rigid covering over the denuded surface, it minimizes sepsis. No large, weeping wounds are left open to invite infection.

(3) Pain is relieved immediately on application of the tannic acid. Montgomery[10], in reporting a series of burn cases in children, treated with tannic acid, noted how these little patients suffered a minimum of pain, as compared with those treated by other methods. The pain of changing adherent dressings is also eliminated.

(4) The coagulum decreases diffusion of body fluids, thereby preventing toxic symptoms.

(5) Beneath the coagulum, healing progresses rapidly. The coagulum serves as a splint. The resulting scar is superior to that formed by other methods, and contractures are rare.

### BURNS DUE TO ACID AND ALKALI

The literature relating to caustic burns is meager. Gradle[11] in 1922 reported cases of severe burns from sulphuric acid used in batteries. He advised neutralization of the acid with a mild alkali, and copious lavage with water. Hinkel[12] later described a similar treatment for burns caused by acid or alkali. First aid is extremely important in these cases. The burned patient should be immediately thrust under a shower, drenching him with water until all excess acid is washed away. Industrial plants using chemicals should have showers installed at convenient places so as to be readily available. The water should be warm, for under cold water some patients may go into shock. Eyes should be washed with warm water.

Immediately following his bath, the patient should be taken into a warm room and stripped of all clothing. Acid burns are best neutralized with solution of sodium bicarbonate. For alkali burns, vinegar serves as a suitable weak acid. Having neutralized the chemical responsible for the burn, one may now treat the wounds just as those produced by dry heat, hot water or molten metals.

Acid and alkali burns not only require longer to heal than other burns, but are more susceptible to infection. Balsam of Peru in castor oil has been found an excellent healing agent for small, scattered burns. Where large areas are involved, tannic acid is better.

COMPLICATIONS

In any large series of burns, some infections will occur. Tannic acid, used early in treatment, permits a lower incidence of infection than any other type of dressing. Should infection occur beneath the coagulum —and this as a rule happens only in deep burns[13]—the crust should be cut away. Resin cerate with 10 per cent balsam of Peru, advocated by Babcock[14], prevents excessive formation of crusts on these infected surfaces, and promotes healing. Even in the presence of infection, granulating tissue will be found beneath the coagulum, and will respond to application of this ointment. Wet boric acid packs have been used, but inevitably produced toxic symptoms[15].

Where infection has gained a foothold before treatment is begun, tannic acid has a minimal value. Necrotic tissue should be removed with forceps, resin cerate ointment applied daily with the gloved hand, and no other dressings applied. In late cases of this kind, splinting of parts may be necessary to prevent contractures.

In third degree burns, grafts may be indicated to prevent excessive scarring and contractions. If the tannic acid coagulum remains adherent at the end of three weeks, one may be certain the burn is of third degree. Autogenous grafts should be early applied. Grafts composed of epidermis alone are not satisfactory. The skin developing from them is thin, abrades easily, is firmly attached to underlying scar tissue which contracts, frequently breaks down, and does not stretch to facilitate movement of the part. Beekman[16] and others advocate full thickness or deep "pinch grafts", placed close together. Immobilization by splinting is important following application of the graft. Where flexor surfaces are involved, the part must be kept in extension during the healing process.

Full thickness grafts are applicable[17] to surfaces on which there is little subcutaneous fat, such as the hands and feet. The pedicle flap may be used on face, arms, legs, and where scars are adherent to bony surfaces.

Curling in 1842 first described duodenal ulcers resulting from burns. Autopsy has occasionally revealed similar peptic ulcers, no doubt produced by circulatory changes caused by direct penetration of heat to the duodenum. Harris described a fatal case in a child of three and one-half years, due to hemorrhage into the adrenal, with ulceration of the duodenum.

Evidence suggests that the kidneys have difficulty in secreting normal urine from a concentrated blood[7]. Impaired functional capacity of the kidneys is therefore found in severely burned patients, with albuminuria and other evidence of damage. Such pathology supports the contention that fluids should be forced.

Bronchopneumonia is the terminal infection in many burned children, occasionally in adults. Otitis media, mastoiditis, suppurative arthritis, and osteomyelitis may occur; even septicemia has been observed. Complications must be anticipated, and treated as they arise. Tannic acid technic has reduced the incidence of severe complications, thereby reducing mortality.

SUMMARY

1. In severely burned patients, blood concentration from loss of body fluids is largely responsible for shock.

2. Treatment for shock, with copious administration of fluids, is the first indication.

3. Burns caused by acid or alkali should be immediately and thoroughly washed with water, then neutralized.

4. Tannic acid, applied by spray, and left exposed to the air, offers the most satisfactory treatment for superficial burns.

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## FOCAL INFECTIONS AND SYSTEMIC DISEASES

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A focus of infection is a circumscribed region in which pathogenic micro-organisms multiply in the tissues. And since it was first recognized that this has an important bearing in medicine much interest has been displayed and a great deal of work has been done on the subject. More conditions are all the while being proved due to this cause and other ailments whose etiology are not thoroughly understood just now are suspected of having this for a cause, too, in some manner, though the proof may be lacking at the present time.

It is interesting to note that Benjamin Rush in 1818 called attention to the connection between diseases of the teeth and certain bodily ailments which he described in the terminology of his time as rheumatism, dyspepsia, consumption, vertigo, epilepsy, and menstrual and nervous disorders. And Judson Daland was probably the first to recognize the role of the tonsils in this same capacity. Of course, it was the epoch-making work of Rosenow which firmly and scientifically proved that the foci, as we know them today, are the cause of certain infectious processes in other parts of the body. He demonstrated conclusively how infecting agents spread; the specific electivity of certain organisms for certain tissues; and he further has produced experimentally practically all of the diseases that we now consider as being caused by the different foci.

It is a well-recognized fact that people harboring chronic foci of infection have a very low resistance to acute infectious diseases. Evans noted, in a study of 23,000 morbidity instances over a period of eight years, that the incidence of the epidemic form of pyogenic infections of the upper respiratory and upper digestive tract was greater in those individuals who exhibited evidence of a persistent low-grade infection of the sinuses or the tonsils than was the incidence of similar infection in those individuals who were free from such persistent nasal and throat infections. He also noted that when the persistent foci were corrected, the resistance to subsequent acute infectious diseases was markedly strengthened. Keyes' work, too, in this regard concerning the teeth, brings similar findings. He showed that the establishment of dental prophylaxis among the children in an orphan asylum reduced the incidence of acute infectious diseases 59 per cent in the first six months and to 2 per cent during the following year.

Another report that bears out the contention that chronic foci predispose to acute infectious diseases is given by Darling. In autopsying a large series of pneumonia cases he found that more than 90 per cent showed inflammatory changes in the sinuses.

The three principal offenders in the role of primary foci are the teeth, tonsils and the nasal accessory sinuses. The teeth appear to cause more direct manifestations of systemic disease than the others, especially in middle-aged and elderly individuals. Dental foci may exist as periapical abscesses, pericementitis, pulpitis, and pyorrhea alveolaris. The infecting agent is usually a low virulence group of the streptococcus viridans.

My experience has convinced me that all devitalized teeth, all old crowned teeth and all large two-surfaced alloy-filled teeth, are potential menaces in the mouth and should be under constant suspicion. They should be considered guilty until definitely proved to be otherwise. And they should be x-rayed at regular intervals, too, for in the majority of instances they will become focal points at some tmie subsequently, even if innocent at the first examination. And I do not approve of temporizing with pyorrhea teeth.

The tonsils come into prominence as foci early in childhood. Bacterial invasion of these structures, and the lymphoid tissue of the nasopharynx is almost universal during the early years of life, as they play an important part in the resistance against general bacterial invasion in the nose and throat. And once infected, the tonsils, with adenoid extension, can cause a great deal of sickness in childhood. They probably send more children to the doctor than any other cause, with the common secondary manifestations of periodic sore throat; repeated "colds"; otitis media; mouth-breathing with the resulting deformity of the dental arch; anemia; anorexia, and so forth. How often tonsillectomies are seen to effect magic-like results in children. With adults a deceiving thing is that many innocent appearing tonsils are diseased. One or more abscesses may be deeply located in the gland. Then, too, atrophied tonsillar stumps and scarred tonsils are particularly apt to be the seats of chronic infection. The micro-organisms occurring in tonsillar foci are mainly from the streptococcus-pneumococcus group.

Originally most of the interest concerning foci was directed toward the teeth and tonsils but in the last few years an exhaustive amount of work has been done on the other centers, especially the nasal accessory sinuses. Chest diseases seem particularly to be caused by sinus foci and those which stand out are chronic bronchitis, asthma and bronchiectasis. Mullin and Ryder in experimental work have shown the sinus lymph absorption was by way of the submaxillary and internal jugular nodes, the lymph ducts, the great veins, the right side of the heart and the lungs. By protracted flooding of these lymph channels with infectious material from hyperplastic sinuses, especially the antra, they have shown how chronic bronchitis may be caused. Frequent chest colds may be the first clinical evidence of this extension, but a definite chronic bronchitis is eventually established and in a neglected case the final result is a bilateral bronchiectasis. And it has been shown that this secondary peribronchial infection may be the causation of bronchial asthma as well as bacterial or pollen protein sensitization. In this connection Freund is of the opinion that even though most cases of asthma are due specifically to the sensitivity to animal danders, foods, bacteria or pollens, this sensitivity is acquired on account of a devitalized bronchial mucosa secondary to an extension downward of a prior similar infection of the para-nasal sinuses.

The chronic bronchitis and early bronchiectasis secondary to chronic sinusitis may closely simulate tuberculous findings in the chest. Colonel Rist, of the French Army, reported a series of cases primarily diagnosed as pulmonary tuberculosis that subsequently were proved due to chronic sinusitis and which were definitely non-tuberculous.

The chest is not alone in being especially attacked by the organisms of chronic sinusitis. Patients with active sinus drainage swallow a great deal of this secretion as it drips down the posterior nasal pharnyx and thus the stomach is being constantly bombarded with the germ-laden material. Often thick mucoid or gelatinous masses will be seen hanging down the naso-pharyngeal wall, causing marked voice changes, and ready to be expectorated or swallowed. The gastric juices kill most, if not all, of these invading infection agents but it has been pointed out by Lawson that in the face of such mass infection potent toxins possibly render the gastric mucosa more easily attacked by bacteria from the blood stream. He has shown that statistically, people with chronic sinusitis are more liable to the common infectious processes of the abdomen, such as gastric or duodenal ulcers, appendicitis, cholecystitis, and so forth, and as Rosenow has experimentally produced all of these conditions the importance of the sinuses as causative agents of infectious processes in the abdomen is readily seen. Focal infection with its characteristic bacterial electivity for certain tissue plus trauma or a low localized resistance from a deficient blood supply appear, in the light of present knowledge, to constitute the etiology of these abdominal diseases. The organisms usually isolated from nasal foci are members of the streptococcus-pneumococcus group; diphtheroid organisms, B. influenza; micrococcus catarrhalis and the staphylococcus.

The problem of focal infections is not one by which an individual focus alone is looked upon as causing a disease. Often more than one are involved. A primary focus causes focalized areas elsewhere and any of these secondary foci may spread the infection to

other foci as the pernicious process spreads, or one or more may immediately cause a systemic disease, becoming primary in this regard. A vicious cycle of foci may be established, any one of which may cause the trouble which sends the patient to his physician.

From the clinical and laboratory evidence at hand at the present time the following acute localized infectious processes are considered as being due to hematogenous metastasis from a primary focalized infection:

Acute endocarditis
Acute pericarditis
Acute pleuritis
Acute peritonitis
Acute infectious arthritis
Acute bursitis
Erythema nodosum
Purpura hemorrhagica
Acute bronchopneumonia
Acute cholecystitis
Acute appendicitis
Acute enteritis
Acute pancreatitis
Acute nephritis
Acute pyelitis
Acute neuritis
Acute myelitis
Acute poliomyelitis
Acute colitis
Acute gastric and duodenal ulcer
Acute conjunctivitis
Acute keratitis
Acute iritis
Acute iridocyclitis
Acute oveitis
Acute episcleritis
Acute retinitis
Acute optic neuritis
Acute thyroiditis
Acute meningitis
Herpes zoster
Acute chorea
Acute myositis
Acute myocarditis
Acute osteomyelitis

Insidious and persistent bacterial focal infections have been found to play a part in the etiology of the following chronic inflammatory processes:

Chronic infectious arthritis
Chronic bursitis
Chronic endocarditis
Chronic myositis
Chronic neuritis
Chronic cholecystitis
Chronic appendicitis
Chronic gastric and duodenal ulcer
Chronic nephritis
Renal calculi
Hypertension
Anemia
Impotence—in the male

And a condition of malaise, lassitude and weakness, possibly with vertigo and insomnia, hypotension and vasomotor irritability, often grouped under the heading of neurasthenia.

Now, regarding the foci which cause all of these infectious processes, grouped in the order with which they are most often met with clinically, they are as follows:

Teeth
Tonsils
Nasal accessory sinuses
Prostate
Appendix
Gallbladder
Rectum
Sigmoid
Uterine tubes
Uterus
Pelvis of kidney
Ureter
Bladder
Lymph nodes, especially peribronchial
Middle ear

Of course, it must be remembered that any organ or tissue when harboring focalized bacteria may serve as an offending focus and produce an extension of the infectious process elsewhere. Two unusual instances in this regard are reported by Billings in which two cases of arthritis were due to persistent infection being present about the finger nails. And Fischer mentions a case of his in which a perinephritic abscess resulted metastatically from an infected wound on the finger.

The diagnosis of focal infections is sometimes easy and sometimes very difficult. An elderly person with arthritis and a mouth full of snags presents no problem at all. Nor does the youth with endocarditis and pus-exuding tonsils. But the majority of instances are fairly difficult to reach a decision upon. Once convinced that a condition is secondary to a focus, a diligent search should be made, by the process of elimination, until the guilty offender is found. Thorough physical examination, roentgenography, and the laboratory examination of smears, secretions and discharges, are the watchwords. Regarding the diagnosis of sinusitis, the x-ray with stereoscopic views is most essential and prostatic secretion should be routinely examined in making all physical examinations of this kind. The importance of stool cultures, also, should be emphasized.

The treatment of determined foci of infection is their immediate removal. In case this cannot be done, as when dealing with the sinuses, mastoid, prostate, renal pelvis, and so forth, the principal aim is to establish freer drainage. And care must be taken to direct attention to all the foci that may be playing a part in the causation of a given ailment. Often both primary and secondary focalized areas may be contributing to the cause. Of course, it is readily seen that both of these must be cleared up if a cure is to be effected. For example, it will do little good to attempt to clear up a prostatic focus which is causing an arthritic complaint, when the prostate itself is secondary to carious teeth. Both the prostate and the teeth must be included in the therapeutic attack in such a case.

Measures to better the general health are also beneficial. In this regard may be mentioned a nutritious diet high in vitamin content, ultraviolet radiation, and the correction of hygienic errors in the mode of living. Autogenous vaccines and nonspecific protein therapy are sometimes of value.

## GRANULOMA INGUINALE

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Granuloma inguinale is found in many parts of the world, especially in the tropics and sub-tropics. It has been reported from Brazil, the West Indies, Porto Rico, Guiana, the Pacific Islands, Australia, the South and West Coast of Africa. I have observed it in Siam and South China, and we know it to be common in our southern states. In a review of the literature I fail to find this disease reported from New Mexico. Recently a Mexican, a native of the state of New Mexico, consulted me regarding an ulcerative condition of the pudenda which upon examination proved to be granuloma inguinale.

Fig. 1. Granuloma inguinale involving the prepuce and glans penis.

Clinically this condition manifests itself as an infective, granulomatous disease of the genitocrural regions. It is not a constitutional disease, but a local manifestation of an as yet undetermined causative agent. As a rule it starts on the genital organs following intercourse (Fig. 1), the incubation period being from five to ten days. One or more very small nodules make their appearance and gradually ulcerate superficially. There is no pain and very little discharge, the lymphatics are not involved. If untreated, it slowly spreads and may eventually involve the entire genitocrural region, even extending down the thighs and above the pubes (Figs. 2 and 3). With such extension there is always more or less mixed infection with the common pus-producing organisms that results in considerable discharge with a very offensive odor.

Fig. 2. Advanced stage of granuloma inguinale.

Fig. 3. Advanced stage of granuloma inguinale in female, involving labiae and genitocrural region.

The infection has a marked tendency to attack apposing surfaces. As it advances it also tends to heal, and the original sites of infection, with the tissues in the immediate vicinity, may be covered by a rubber-like scar that breaks down readily either as a manifestation of a reinfection or an acute exacerbation of a quiescent pathological process.

The entire infected area presents, as a rule, a slightly elevated excoriating and superficially ulcerating picture. In very advanced and untreated cases, complications, the result of contracting scar tissue, may manifest themsleves. Pseudo-elephantiasis, urethral stricture and rectovaginal fistulae have been reported.

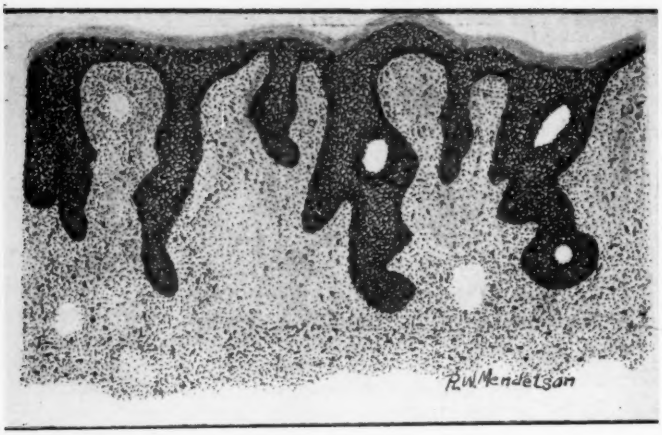

Fig. 4. Drawing to illustrate the microscopic appearance of the tissue from edge of lesion of granuloma inguinale.

Fig. 5. Drawing to illustrate cell containing Donovan bodies. This shows the structure of the Donovan body, with the rod connecting two polar dots.

Pathologically, the disease has been compared to rhinoscleroma. The drawing (Fig. 4) represents the margin of an infected area. There is a small round cell infiltration of the corium, many plasma cells, but no giant cells. The growth is vascular, but not hemorrhagic, and there is no suppuration. As a result of the round cell infiltration the papillae increase in length and produce the typical papule. At the same time there is an increase of the interpapillary processes of the epidermis. In the older parts, the cells become swollen and disappear, being replaced by connective tissue and as this shrinks the area becomes scar-like.

The cause of granuloma inguinale has never been determined. Many observers have reported on the so-called Donovan bodies, first described by Donovan in 1905. This organism is a capsulated intracellular body; stained with Wright's stain it appears as portrayed in the drawing (Fig. 5). A very fine rod connects the characteristic bipolar extremities. Castellani places it in the group B. lactis aerogenes, probably B. mucosus-capsulatus of the Friedlander group. In smears from an infected area it is found in the endothelial cells.

The cultivation of this organism on Sabourraud's medium is not difficult. It becomes pleomorphic in forty-eight hours. Considerable work has been done in an attempt to prove the etiological relationship of the Donovan body to the disease, granuloma inguinale. Some observers have reported positive results. I have made many inoculations with pure cultures obtained from active cases, but have never been able to produce a lesion that resembled the original disease. A variety of subjects was used for experimental purposes, including rabbits (Fig. 6), apes, negroes and myself

Fig. 6. Local abscess in rabbit's ear inoculated with Donovan bodies.

(Fig. 7). In every case I was rewarded with a simple abscess. Cultures made from these abscesses remained negative and smears from the same revealed only an occasional organism. Smears made one week after the appearance of the abscess were negative, only pus cells being present. Observing the inoculation on my own arm over a period of months fails to reveal any other reaction than the primary abscess.

The treatment of this condition includes the actual cautery, x-rays, and the intravenous administration of tartar emetic. Some

cases respond to one form of treatment while others do not. Each case seems to be a personal equation to a degree and, while tartar emetic produces very satisfactory results in early cases, the more chronic ones tax the endurance of the patient and the ingenuity of the doctor.

Fig. 7. Lesion on author's arm inoculated with Donovan bodies.

## THE MEETING OF THE AMERICAN COLLEGE OF PHYSICIANS BALTIMORE — March 23-27

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(Report read to the Bernalillo County Medical Society at Albuquerque, N. M.)

The meeting was called to order Monday afternoon, March 23, by Dr. Maurice C. Pincoffs, Baltimore, Chairman of the Arrangements Committe, who stated this was the first time the College had ever returned for a second visit to the same city. Ten years ago they met in Baltimore and then had only four hundred members; now they came back with over two thousand.

The first address of welcome was made by Dr. Joseph S. Ames, President of Johns Hopkins University. Dr. Ames stated that Johns Hopkins appreciated keenly the opportunity of extending a welcome to the College. He said we all know what Johns Hopkins had to offer and felt that they would be benefited more by the meeting than we would, as the presence of the leaders of medicine from all over the country and their clinics would certainly be a stimulus. They felt they had been preparing for weeks for a very scrutinizing examination and that this preparation and examination would be very beneficial to all of them.

Dr. Raymond A. Pearson, President of the University of Maryland, said the University was happy to join in the welcome and felt highly honored to have us with them. He wanted us to feel that their welcome was a hundred per cent. The University of Maryland is made up of several parts that had been acquired at different times and has medical, dental, law and pharmacy departments. The oldest building in America which has been continuously used for medical teaching belongs to them. They honor our organization because its purposes are the upholding of high standards and such organizations are badly needed. He further said that actions speak louder than words and the program they had prepared was their welcome.

John M. G. Rowland, President of the Medical and Chirurgical Faculty of Maryland, said they wanted to add their welcome; their society was organized in 1799; their name is long but it is the State Society and it has taken itself seriously from the first. In 1790 they had 240 members but at that time only 40 of the members were medical men. They now have a splendid hall, library and lounging room.

Dr. L. P. Hamburger, President of the Baltimore City Medical Society, said they also wanted to welcome us. He said Baltimore has the first Washington monument. The first reading, singing and playing of the Star Spangled Banner was in Baltimore; it was noted for its wonderful oysters, beautiful women and brave men, may we long remember the meeting and may we want to come back.

Dr. Syndey R. Miller, President of the American College of Physicians, in his address as reply to the addresses of welcome, said that he was a guest in his own home town but that he wanted to help as host and that he wanted to give credit to a great many people who had helped in the preparation of the program whose names did not appear in print. He said all the hospitals had helped and practically all the doctors connected with the clinics and that he hoped the program would prove as satisfying as it looked.

Dr. Julius Friedenwald, of Baltimore, discussed "The Clinical Significance of So-Called Chronic Appendicitis". He stated conflicting views are held with regard to this condition; that operations are frequently done with unfavorable results. A diagnosis of chronic appendicitis should rest on a history of previous attacks and the chronic

disease is often only a part of a general disturbance in other parts of the alimentary tract which the removal of the appendix does not clear up at all; such conditions may involve the stomach, duodenum, liver, gall bladder or colon; x-ray findings are not conclusive, as there may be changes in shape, size and position, with kinking or fixation, filling or non-filling, any one or all of which are often seen without symptoms. When symptoms are present they are not distinct; pain may or may not be significant, as right lower quadrant pain is often caused from pelvic conditions or may be due to conditions in the abdominal wall itself. Diagnosis is hard to make, often cannot be made and should never be made without a history of previous attacks. He had a history of one hundred cases who were operated on with poor results.

Dr. Thomas R. Brown, Baltimore, discussed "Early Diagnosis of Neoplasms of the Digestive Tract." Therapy is the ultimate for which we strive. Early diagnosis is essential and withuot it we fail, yet early diagnosis is often possible. These growths are on the increase due to new forms of trauma, excessive consumption of meat, and lack of roughage. Occupation plays a part. Facts as to causes do not help, the only hope being in early diagnosis. A history of the case often gives a clue and yet eight-five per cent have had no previous trouble. Lesion often begins in the lesser curvature—the silent area. Ulcers sometimes develop into cancer, but rarely do so. Some metastasize early—they are the hopeless cases. He said he has had no success with anything but surgery. If the trouble lies in the small bowel, early diagnosis is impossible and notwithstanding operation, these cases do not live over three years. In the large bowel, however, you have better chances. In intestinal neoplasm, symptoms are often misleading; many cases in the large bowel could have been diagnosed much earlier had they been suspected. Analysis, history and study of the patient will lead to proper diagnosis. It is wiser to operate on suspicion than to wait until diagnosis is evident. Treatment is early, bold and radical surgery.

Dr. Lay Martin, Baltimore, discussed "Gastric Secretion". He made a study of gastric secretion by inserting a tube into the stomach and constantly withdrawing the secretion. He had the point of the tube located with a fluoroscope so that he knew from just what point he was drawing his secretion. The stomach was stimulated by histamine. He found chlorine is secreted when the acid falls and trypsin was increased. This happened when the contents became alkaline which showed this was due to regurgitation of fluids from the small bowel. Histamine increased both volume and acidity of hydrochloric acid and neutral chlorides. The hydrochloric acid increases in amount and increases in strength but the basis remains the same. The urine also changes as does the blood during gastric secretion.

Dr. Fred M. Smith, of Iowa City, gave a paper on "Studies on the Mechanism of the Pain of Peptic Ulcer." These tests were made by inserting a small rubber balloon connected with a duodenal tube and having it connected with a graph so that the contractions of the stomach were recorded. Then by inserting another duodenal tube he made his observations. The introduction of air into the colon caused pain, severe and frequent contractions were recorded by the graph. The patient was then given atropine; the pain was relieved and the contractions ceased. When given more air, the pain recurred. Sodium hydroxide was introduced into the stomach and the pain stopped. The contractions of pain in cases of duodenal ulcer cease during sleep. Air in stomach causes distress and contractions. One-half per cent solution of hydrochloric acid into the stomach quieted the waves. The introduction of air caused distress and its aspiration immediately relieved distress. Sodium bicarbonate increased the contractions and atropine stopped them. Epigastric pain after meals and introduction of air brought on pain and the giving of milk stopped it. There was no relation whatever between the degree of pain and the acidity. His conclusions were that the pain depends on gastric activity.

Dr. Russell L. Cecil, of New York, discussed "Rheumatoid Arthritis." He said arthritis might be considered the stepchild of medicine, that it has received very little attention, most doctors feeling like jumping out of the window when a patient with arthritis comes into the office. Osteoarthritis in the aged is a phase of senescence and is the result of degenerative processes of age. Rheumatoid arthritis is an infection with moderate fever, loss of weight, an increase in the amount of granular tissue in the joints. In 65 cases he was able to get streptococci by culture. In some of these cases it took three or four weeks to get the culture. They were accompanied by peri-articular swelling and roughened joints. Tests for streptococcic agglutinin were positive in 97 out of 103 cases and his controls were negative, and the streptococci injected into the veins of rabbits gave typical joint lesions in ten days which he was able to demonstrate

by x-ray. The more advanced the arthritis, the more potent the agglutinations.

Vaccine therapy has been brought back into favor by this work. Rheumatoid arthritis is regarded as a specific disease caused by a special strain of streptococcus hemolyticus intermediate between the viridans and the ordinary hemolytic type. He has treated several hundred cases by vaccine prepared from the typical strain. The vaccine is killed by formalin and injected subcutaneously and intravenously. Uses small doses and avoids reactions. Results fall into three groups: those who recover completely; those who partially recover and become stationary; those who show no effect. Consider vaccine an important therapeutic agent in treating rheumatoid arthritis; how much of the effect is specific and how much due to foreign protein reaction is questionable.

Dr. Warfield T. Longcope, Baltimore, read a paper on "Variations in Manifestations of Rheumatic Fever in Relation to Climate." Dr. Longcope said rheumatic fever is a disease very rare in the tropics, that in the examination of 150,000 hospital cases in the tropics, there were only three cases of rheumatic fever. The disease becomes more prevalent as you travel north. In the southern states it is not nearly so common as in Baltimore and in Baltimore it is not as common as in Boston. In the district of Montreal and across Canada it was more common even than in Boston. He had an analysis of 142 cases in Johns Hopkins Hospital during a five-year period; of these 135 developed cardiac complications. He considers rheumatic fever essentially a disease of the heart. In acute form it may be severe or fatal and it was definitely a valvular disease in 125 cases. He found that while rheumatic fever was not as common in Baltimore as in Boston, cardiac complications are more common in Baltimore than in Boston. Rheumatic fever as seen in Baltimore is essentially a carditis and gives a different clinical picture from that seen farther north.

Dr. William S. Thayer, Baltimore, discussed "Some Phases of Endocarditis." His conclusions were based on 76 autopsies and 306 cases of endocarditis. He stated that infection in these cases is clear; it is not proved that it is streptococci but it is suspected. The two principal forms are the acute, malignant endocarditis in which death occurs within a few weeks and the subacute or chronic endocarditis. This may be so insidious that disease of the heart is not even suspected. He stated the rheumatic type of cases come on as a "thief in the night". He found the valves affected were, in order, the mitral, aortic, tricuspid, and pulmonic very rarely. Rheumatic endocarditis is a single picture of general disease. It is present in chorea and leads to death through myocardial failure. Emboli are often distributed by the blood and deposited in the kidneys, spleen, skin or under the skin. Gonorrheal endocarditis ends often in recovery. The distribution is similar to rheumatism. Subacute endocarditis is generally fatal. Recovery from infectious endocarditis is not as rare as usually thought. Multiple emboli may cloud the diagnosis and the distinction between rheumatism and infectious endocarditis may be easy but at times is very difficult, and can only be made by carefully considering all the evidence.

Dr. Henry A. Christian, of Boston, discussed "Chronic Myocardial Insufficiency, Chronic Non-Valvular Cardiac Disease and its Therapeutic Management." He stated rheumatic fever is the largest cause of valvular disease. The majority of cases of rheumatic fever began in childhood or early life and it's a condition which occurs again and again. The average case dies in twenty years, so the valvular heart conditions among the older people are not of rheumatic origin. Syphilis affects only the aorta and syphilitics develop their trouble in fifteen to twenty years. After forty years of age, the cardiovascular diseases increase and these are neither rheumatic nor luetic. Senility causes many evils in life, but it does not have much to do with this trouble. Hypertension is somewhat like what Mark Twain said about the weather: "Everybody talks about it, but nobody does anything." Focal infections should be cleared up, but clearing up imaginary infections benefits no one, especially the patient. Diets of all kinds have been advocated; we have the high carbohydrate diet and the low carbohydrate diet, the low protein and the high protein diet, in fact, all manner of diets have been recommended. Digitalis therapy should be begun as soon as we detect any enlargement of the heart. He emphasized this fact as someone had quoted him as stating digitalis was only of use in cases of auricular fibrillation and he wanted to correct that wrong impression.

"The Causation of Cardiac Pain" was discussed by Dr. Alexander Lambert of New York. Cardiac pain is caused by spasm of the coronary arteries. The nerves come from the autonomic nervous system. The outlying ganglia give off the nerves. The sympathetico-adrenal system controls the heart, respiration, kidneys, and the emotions affect

these centers. The increased aortic pressure increases the coronary flow. The coronary flow increases and diminishes in direct proportion to the heart action. A puncture of the radial artery will cause more pain than a puncture of the brachial. A puncture of the radial artery causes swelling, vomiting and defecation. Stretching of the vessels causes pain and sometimes a rise in blood pressure will cause pain. Pain arises from efferent nerves in the intima of the coronary arteries. Pain may be accompanied by symptoms over a wide area. May have sweating, salivation, nausea, desire to urinate or defecate and loss of consciousness. Sympathectomy and removal of cervical ganglion is successful in eighty per cent of the cases. Cardiac pain is increased by increased exertion. Going into a cold room, getting into a bed with cold sweats, or a cold bath; this cold causes the skin muscles to contract, increasing the volume of blood in the heart and distends the coronaries. Nicotine poisoning causes increased pain in heart and anger, sorrow, joy or fear may increase the pain. Aortitis may be found with a history of pain or without pain. Pain does not occur without distention.

Dr. Alvan L. Barach, New York, spoke on the "Therapeutic Use of Oxygen in Heart Disease." Uses oxygen in an oxygen tent or in an oxygen chamber, securing from forty to sixty per cent increase in the oxygen in both the arterial and venous blood. Patients with edema, after using oxygen a few days, develop diuresis; one patient lost 32 pounds in two weeks. One patient, when taken out of oxygen room at once began to be short of breath and the urine stopped; upon being put back into the oxygen room, she lost the dyspnea and began again the diuresis. One girl lived in an oxygen chamber for seven months. As long as she remained there, she remained comfortable, but if taken out she immediately had dyspnea. Another girl remained in the oxygen room for five months and was able to be taken out gradually.

Dr. Alex M. Burgess, Providence, R. I., gave a paper entitled "The Reaction to Nitrites in the Anginal Syndrome and Arterial Hypertension." The cause of pain in angina is not understood. The use of nitrites causes temporary but no permanent reduction in pressure. In a test of the blood pressure in a normal invididual, there was no drop in the systolic pressure and the diastolic pressure rose. After inhalation in anginal attacks, systolic drops, then rises and then goes back to what it was before. A hypodermic of sterile water gave the same reaction as amyl nitrite. Nephriton (1/100) under the tongue causes a rise. In a case of essential hypertension, he gave 1/100 gr. amyl nitrite and caused a drop in 15 seconds with an almost immediate rise. In a composite of 16 cases, there was no effect in diastolic and very little in systolic. In angina pectoris it gave a marked drop in pressure and complete relief from pain. In angina pectoris with B. P. 200/100 amyl nitrite stopped the pain. In another patient, glonoin relieved the pain. The pain may disappear before the drop in pressure. Pain and blood pressure do not seem to go hand in hand. His conclusions were: first, the usual symptoms vary greatly; second, there is no consistent change in diastolic or systolic pressure; third, in some cases there is a sharp fall and a quick rise; fourth, no consistent change, usually a sharp drop and then a rise to, or above, former levels. In the anginal syndrome a sharp drop and then a rise. The pain relief is instant without relation to blood pressure. Pain relief is indepednent of pressure levels but is due to action of increasing coronary blood supply.

"The Insulin Coefficient and Improved Method for the Clinical Control of Diabetes Mellitus," by John R. Williams, Rochester, New York. He stated that the diagnosis and treatment of diabetes mellitus is as yet unsatisfactory. He said that the amount of insulin which a patient can make gives a basis on which to figure how much he needs. One unit of insulin is utilized by four grams of glucose and a normal individual will make 100 units of insulin. Borderline diabetics make about 75 units; mild diabetics make 40 units; moderaetly severe diabetics make 20 to 40 units and the severe cases below 20 units. Sporadic blood and urine tests are valueless. The insulin coefficient method offers the best guide and leaves nothing to guesswork.

Dr. Harry L. Alexander, St. Louis, Missouri, discussed "Evaluation of the Skin Test in Allergy." When the introduction of skin tests was first developed it was assumed that the skin was consistently sensitive. This is fallacious. The skin, respiration and gastro-intestinal tract bear the brunt of allergic reactions. Only asthma results when it is the respiratory tract that reacts. The intradermal test in sensitive and delicate skins will mislead you. Two observers with the same agents will get different results. Hay fever is present in 93 per cent of the cases. Vasomotor rhinitis, skin and nasal mucosa are often together. Positive reactions will vary from time to time and retesting should be practiced. A negative re-

action to a test in the leg, was three plus in the back of the same person. Some portions are sensitive and others are not. If the skin test was reliable, anyone could work out a case, but since it is not, it requires deep study and other underlying conditions may have an effect.

Dr. Lewellys F. Barker, of Baltimore, discussed "The Trend in Cerebral Localization." He said there was no more fascinating subject in medicine and that much progress had been made during the last ten years, but that as yet we were only on the threshold. Tracing out the tract by electrical stimulation has accomplished much. The whole cortex was studied and mapped by Broadman. In the blood supply of the cortex it is surprising to see how closely interwoven the capillaries are and by digesting out the brain tissue and leaving only the blood vessels, it looks as though there were no brain tissue at all. The distribution of lesions in encephalitis is also very interesting. In some cases there were only small abrasions and in others the myelin sheath was destroyed and in others the paravenous infection follows along the course of the veins. In some cases the basal ganglia seem to be particularly involved and distortion of the ventricles gives much information and surgeons can localize the trouble and cut down on it. X-ray information is very illuminating. There is more complete charting of the brain surface now than ever before, though some men have allowed their imagination to get ahead of the known facts. There seems to be an inter-relation between the whole surface of the brain, and the removal of an area of surface not only affects the centers involved but also affects, to a certain extent, the whole brain, making it appear that the entire surface is interrelated in what might be termed group function.

Dr. Wardner D. Ayer, Syracuse, New York, spoke on "Spontaneous Subarachnoid Hemorrhage," and gave a report of 29 cases. Aneurism is most often a congenital defect and a distinction between a subarachnoid hemorrhage and cerebral hemorrhage is impossible. Syphilis is unimportant. These hemorrhages are often due to ruptured aneurism in some part of the circle of Willis. In this type of case we get a slow pulse, slow respiration, rigid neck but not retracted, fever, sometimes high. Diagnosis is very easy if it is thought of. The spinal fluid is usually bloody and this will be followed by xanthochromia. Relief is seen on withdrawing fliud. Bloody fluid without localizing symptoms will make a diagnosis. It is better to withhold puncture 24 hours, but repeat often enough to relieve pain. He showed pictures of quite a number of aneurisms. He stated some of his cases died during lumbar puncture and others died without it, making conclusions difficult.

(Continued in June Issue)

## AN UNUSUAL CASE OF PULMONARY DISEASE

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(Presented at the meeting of the Maricopa County Medical Society, held Jan. 26, 1931.)

For the sake of making it somewhat more interesting, the diagnosis was not given in the heading but you will have an opportunity to make your own diagnosis from the history, x-ray plate, and so forth.

The patient is an automobile dealer, aged 57. Although he lived on a farm while a boy, the major part of his life has been spent as a city dweller.

There is no history of tuberculosis, cancer, heart or kidney disease, in the family. He has enjoyed unusually good health throughout his life, the only sickness which he can recollect being typhoid fever 21 years ago, from which he made an uneventful recovery. Although he believes he has been well until about two years ago, his wife feels that he has been somewhat below par for some years and has had occasional night sweats.

He dates his sickness from February, 1929. He was on a train trip and during the day went to sleep sitting with a pillow back of his head. He awoke coughing violently, having fallen over to one side so that his head was inside the pillow slip. He had severe paroxysms of coughing during the next ten days. The cough was very violent but non-productive. He believes he had considerable temperature for a couple of weeks but did not take it. However, he has never felt well since that time and has gradually lost weight. During the summer of 1929, he ran a temperature every day between 99 and 100 degrees and in September had an x-ray of the chest which showed some clouding just above the diaphragm on the left. His physician felt that it was of little consequence and advised him to rest for a couple of months. During the fall of 1929, he felt weak and had an occasional slight non-productive cough, with afternoon temperature of about one degree. In February, 1930, he felt so debilitated that he gave up his work. X-ray the latter part of February showed enough cloudiness at the left base to suggest fluid and an attempted aspiration was done on March 6, 1930. There is some question whether anything was obtained, but at most it was only a few drops of clear fluid which revealed nothing. He developed what was diagnosed to be pneumonia in the left base immediately after aspiration.

In April and May he was in the Johns Hopkins Hospital, where careful studies were made and the conclusion was reached that he had a probable malignancy at the left base. He raised sputum only once while at Hopkins and it was negative for tubercle bacilli or unusual findings. Bronchoscopy was attempted but was unsuccessful. He was treated with radium over the left base. His symptoms were somewhat increased after the radiation. After leaving Hopkins he spent a month in Asheville, N. C., without relief. The month of August was spent at the Mayo Clinic. There bronchoscopy was successfully done. The exam-

ination disclosed considerable infiltration in the walls of the bronchi in the lower lobe of the left lung with a moderate amount of mucoid secretion. No foreign body was found. There was no ulceration and it was not felt advisable to remove a specimen of tissue for microscopic examination. The conclusion was reached that the condition was inflammatory, probably tuberculous. The fact that the condition had existed for eighteen months, that no superficial glands had developed, that his general condition was fair, and that there was no ulceration of the bronchus, was, in their opinion, sufficient to almost certainly exclude neoplasm in his case.

After leaving the Mayo Clinic he was for varying lengths of time in Denver and El Paso, in excellent sanatoria, with no definite diagnosis made.

He was first seen by us on Oct. 1, 1930. There were few findings of significance on the physical examination other than the lungs. The right lung showed little but there was dullness to flatness at the base on the left, with absent breath sounds and absent tactile fremitus. Above this area behind, in the middle third, was an area which showed bronchial breathing, whispered pectoriloquy and moderately coarse rales after cough. The movement on the left was very limited. There was a contracture of the capsule of the left shoulder joint so that he had very slight movement of the joint—due, he believes, to the fact that he has purposely not moved the arm for the last year. There was a slight contracture of the right hamstrings, which came on a few months previously associated with what was called rheumatism. The pulse was 90, temperature 100 degrees, blood pressure 110/66. The blood findings were: white count, 10,600; red cells 4,510,000; hemoglobin 80 per cent; polynuclears 87 per cent; monocytes 13 per cent. Feeling that the sputum should tell the tale, careful examinations were made and on the second trial, streptothrix were found. This has been confirmed on many repeated examinations since then and the streptothrix has been isolated in pure culture. About the middle of October, he started to suffer with intermittent pain in the left shoulder and upper chest posteriorly. At first it was relieved by counter irritants but later became more severe and constant and this pain has been a major feature among his symptoms. On October 19, a left phrenicectomy was done for its relief. At first it was much better but then returned with renewed force and has persisted in spite of large quantities of all kinds of analgesics.

Feeling that perhaps some relief from symptoms would be afforded by an aspiration, and a cure be effected, it was tried on Nov. 27. Although a large needle was used and a trial made in two most likely places, no fluid was obtained. About a week later a swelling appeared over the anterior chest at about the level of the fourth rib. This was several interspaces higher than the nearest site of the attempted aspiration. This swelling was tender and increased very slowly in size and after a number of days was incised and about four ounces of very thick greenish pus evacuated. This incision is still draining, the pus apparently coming from inside the chest through the fourth interspace. The pus showed a pure culture of streptothrix.

Iodides were started as soon as a diagnosis was made in October, as much as 200 grains a day of the potassium iodide being given by mouth. This was later changed to sodium iodide intravenously but so much objection was raised to the intravenous medication that it was stopped and he is now receiving about 120 grains of potassium iodide a way, without any symptoms of iodism.

Skin tests were made with the broth in which the streptothrix was grown and also an extract from the streptothrix, and, as the extract gave a fair reaction, he has been treated with increasing doses.

So far there has been no improvement, but rather a gradual loss in his general condition. There has apparently been no spread of the infection into other parts. Another vaccine is to be tried, using the actual organisms rather than the extract.

A few words might be appropriate regarding this rather rare infection. Petruschky's classification subdivides the filamentous organisms into four groups: Leptothrix, including those forms appearing as simple threads without branching; Cladothrix, those shownig false branching; Streptothrix, those showing true branching; and Actinomyces, those characterized by the presence in the tissues of "sulphur granules" in which the filaments have a stellate arrangement and clubbed ends.

Streptothrix has been reported as causing disease in the eyes, the upper and lower respiratory tract, gastro-intestinal system, spleen, kidneys, brain, bones, heart and skin. About one in six of the cases reported have been in the respiratory tract. It should be kept in mind when a patient presents himself for examination suffering from a chronic suppuration with pyemia, or from what appears to be a case of pulmonary tuberculosis except that the tubercle baccilli cannot be demonstrated in the sputum. The streptothrix can usually be found in the sputum where that infection exists. It is probably introduced into the respiratory tract by close association with vegetable products, as grain or straw—many cases on record being among straw chewers. The pathology in the lungs shows miliary abscesses and areas of necrosis in the bronchi, bronchopneumonia, invasion of the tissues and later the pleura becoming involved with perhaps extension to the chest wall.

The prognosis is exceedingly bad, only a few cases of pulmonary streptothrix infection having ever recovered. However, the earlier the diagnosis is made the better the chance that it can be overcome with a vigorous use of the iodides, vaccine, drainage, or whatever the appropriate medication may be.

## CASE OF ABDOMINAL TUMOR
### (Diagnostic Discussion)

**J. D. HAMER, M.D.**
**Phoenix, Arizona**

(Presented and discussed at Staff Meeting of Good Samaritan Hospital, December 22, 1931.)

Mrs. F. W., female, age 37, first seen in consultation in July of this year. Since April, she had been having diarrhea with numerous bowel movements daily and was passing blood and mucus continuously. Her hemoglobin had been down to 35 and she had received three blood transfusions. She had had complete gastro-intestinal x-ray, blood, urine and stool examinations. The only positive findings were her marked secondary anemia and much blood and pus in the stools. There were flagellates present also in the stools. She had no gastric symptoms at this time and had not lost much weight. No amebae were found, but on account of the blood and pus and flagellates, intestinal amebiasis was suspected and she was given intensive treatment, including emetine and iron and opiates but nothing affected her frequent bowel movements. She entered the hospital September 4. At this time she had almost reached the point of emacia-

tion. She was still having diarrhea and had developed considerable pain and gaseous distention over upper abdomen and had been vomiting after every meal for some time. At this time she had 3,180,000 red cells; hemoglobin 55; W. B. C. 9000; polys 80; monos., 20; urine, sp. gr. 1017; trace of albumen; few granular casts, 2-3 pus cells. Subsequent urine examination showed specific gravity as high as 1032, one plus albumen, 2-10 red blood cells; 2-8 pus cells and some mucus. Wassermann was negative and chemical test for bile in the blood was negative. Blood, pus and flagellates were present in the stools.

Physical examination showed a very much emaciated female, pulse rate 120; the blood pressure was 112/80. Head, neck, mouth, lungs, heart were negative. No abnormal reflexes. There was a large rather smooth tumor in the left abdomen which was slightly tender and freely movable and extended from the costal margin to the pelvis. During the first day in the hospital she felt a slight numbness in her right arm and a few minutes later she had a complete paralysis of the right side of her body. At this time there were no cerebral symptoms and no aphasia. Examination of the colon at this time with barium enema showed no definite obstruction, the colon filling promptly as fas as splenic flexure. At this point, pain was complained of and spasm of the bowel was evident and as the barium entered the transverse portion of the colon there was spasm at this portion of the bowel and evidence of intolerance. Barium suspension passed on into the hepatic and ascending colon these showing normal contour. The findings are quite conclusive for some type of lesion involving especially the transverse portion of the colon, the irregularity in contour being most marked at the junction of the transverse with the splenic flexure. The mass that could be felt in the upper abdomen appeared to lie in front of descending colon and was believed to be an enlarged spleen. One consultant thought at this time that the tumor was the left kidney and made a diagnosis of hypernephroma. Another thought the tumor was the spleen and his diagnosis was Banti's disease and he advised splenectomy. The patient was given 500 c.c. of blood after which the red cells rose to 4,000.000, and hemoglobin to 60. When the opiates which were given to check the diarrhea were withdrawn. patient ceased to vomit and was able to eat fairly well. There was some improvement in the hemoplegia and patient could flex the thigh and move the right arm some until about eight days after the first stroke when she had an extension of the hemiplegia which produced complete paralysis of the entire right side which also involved the right side of the face and produced an aphasia. After this she never moved the arm and leg. She received two more blood transfusions. During the first four weeks in the hospital her temperature varied from normal to 101 and 102. One day it rose to 104. Pulse ranged from 100 to 140 and respirations from 20 to 30. The temperature curve shows a gradual rise of the mean temperature, however. She had no reaction after the first transfusion. A very slight reaction after the second. After the third transfusion on September 22nd, her temperature rose to 104. Up to this time patient had been doing fairly well. Withdrawal of opiates which had been given to check frequent bowel movements resulted in relief from vomiting. In fact all gastrointestinal symptoms were considerably alleviated. From the time that the hemiplegia became complete, patient complained of considerable headache on the left side. There were no eye symptoms and no increase in blood pressure. There was some improvement in the aphasia at times but following the reaction after the last blood transfusion, patient's sensorium was more or less clouded. On October 1st, patient had a severe chill and temperature rose to 105.2. Maximum daily temperature was 103 until October 5th when patient had another severe chill and temperature rose to 106.2. On the morning of October 10th, patient had a severe chill and temperature rose to 107. By five p.m. it had dropped to 98 when she had another chill and it rose to 105 again. After this, her temperature gradually came down and her maximum temperature was 101. During this time blood was examined for malaria but none were found. During this time there seemed to be an increase in size in the abdominal tumor. It was freely movable and could be palpated definitely in the left lumbar region. It was fairly smooth, not especially hard. At times it was tender and what was apparently a very definite splenic notch could be palpated.

Blood pressure on October 12th was 100/60. On October 8th, red count was 4,280,000; hemo. 80; white count 8,700. For several days prior to October 14th, patient had been eating fairly well and at times was having almost normal bowel movements. Patient and family both insisted on operation and on October 14th, under sodium amytal anesthesia intravenously, and a few whiffs of ether, a laparotomy was performed. Patient made a fairly rapid recovery with practically no reaction following the operation. Condition continued about the same and on October 20th she was sent home in an ambulance. From this time until the 15th of November her condition remained practically stationary. There was no change in her cerebral symptoms. At times her bowel movements became rather frequent. During the night of November 15th she became suddenly worse and died in about two hours.

## DISCUSSION

In reviewing the salient features of this case, I would like to call attention to several which I believe have a direct bearing on our diagnosis; these are long standing diarrhea with blood and mucus in the stool, flagellates found in the stool examination, extreme emaciation, secondary anemia, a large, smooth, freely movable tumor in the left abdomen, spasm and intolerance of the transverse colon with pain elicited at the splenic flexure, a transient hemiplegia, later a complete hemiplegia, with aphasia, of the right side, and chills and fever in the late course of her disease, together with a rapid pulse, but with no elevation of the blood pressure at any time. No signs or symptoms of obstruction of the bowels were present.

I believe the main pathological feature of the case is the tumor mass, and a diagnosis of this condition must be made if we are to account for the primary factor leading to the death of the patient. One would think of a large ovarian cyst, but apparently the physician on the case did not consider this tumor of that type; at least we have no information relative to a pelvic or rectal examination. And we do not know whether the tumor was flat, dull, or tympanitic to percussion. One might think of a large diverticulum of the bladder, but the urinary fnidings are not conclusive, and we have no report of a cystoscopic or other urinary tract investigation. I do not believe that this case was one of Banti's disease, as represented by the history, especially. Banti's disease usually runs a more chronic course, and is quite uniformly notorious in that the patient has attacks of hematemesis, and this point alone is often diagnostic. It is true that these cases get quite a secondary anemia after a few years of the disease, but they also show

a leukopenia in uncomplicated cases, and I should imagine a case of Banti's in a patient as sick as this one, that we would find jaundice, evidences of cirrhosis of the liver, ascites, and a marked albuminuria. However, in this case, we have some evidences in favor of Banti's, such as marked anemia, a tumor mass, with a palpable notch, and digestive disturbances. A chronically enlarged spleen may also occur from some other etiological cause, but the evidence we have here cannot support any of the following considerations: A large "monkey spleen" from tuberculosis; syphilis with a negative history and Wassermann; chronic malaria in spite of late chills and fever; Hodgkins' disease with no other information for support; leukemia; pernicious anemia; polycythemic splenomegaly from the lack of positive blood findings; or associated rare diseases of the liver and spleen, as hypertrophic cirrhosis of Hanot, Gaucher's disease, and new growths of a benign or malignant character, which, although occurring occasionally, are rerely diagnosed.

The pancreas must be consdiered. Cysts and other types of tumors occur. There is nothing here suggestive in the stool examination in favor of pancreatic disturbance. Also, the symptoms of pancreatic tumor are interpreted more from the standpoint of the regional effects, such as gastrectasis from pressure exerted on the duodenum or pylorus of the stomach, portal vein pressure giving us a picture of cirrhosis with ascites, persistent jaundice and deep color when the common duct is compressed, and symptoms of intestinal obstruction or paralytic ileum from interference with the mesenteric vessels, or symptoms of an abdominal aneurism if the aorta is compressed. Cysts of the tail or body of the organ, or other tumors, occur, and have to be differentiated from hydronephrosis, hypernephrosis, omental or ovarian cysts, suprarenal tumors, cold abscesses, and retroperitoneal cancer (sometimes called Lobstein's cancer). Most of the pancreatic tumors are situated between the greater curvature of the stomach and the transverse colon, and transmit bruit from the aorta but in this case I do not feel that the tumor mass was located in the position indicated. We should also expect to find a tumor mass of the cisterna magna in a slightly different location than this one. These types of tumor masses occur occasionally.

Is the tumor mass a hypernephroma, or other type of kidney tumor? I do not believe so, although we have no findings recorded except a couple of urine analyses. Unilateral hydronephrosis occurs, and in non-infective cases the urine is quite clear, the specific gravity is low, traces of albumin are found, and the mass is palpated in the renal region. It is characteristic of this type of tumor, especially when occurring in a movable kidney, to periodically empty itself with the passage of a large quantity of urine. In infected cases, of course much pus is found in the urine. In hypernephroma, generally the first indication is hematuria, and the lack of this symptom alone would be against a diagnosis of this condition. However, in these cases patient may have pain, intestinal disturbances, and progressive emaciation, and one may feel what seems to be a notch in the tumor mass, because of the hemispherical projections which correspond to the distended sections of the kidney. This type of tumor is also malignant, and can metastasize, and if this patient had one more symptom (hematuria), I would feel very strongly toward hypernephroma, or some other type of malignant kidney tumor.

Another condition which must be ruled out is diverticulosis. This is an inflammatory process of the colon, usually in the descending or sigmoid portion, chronic in nature. In some cases, where many diverticula are involved, adhesions form to the surrounding structures, and a tumor mass consisting of dense fibrous tissue forms, including diverticula with fecal concretions, and sometimes multiple small abscesses. At times, secondary invasions of cencerous tissue develop. During the development of this condition, the patients have signs of chronic bowel obstruction and constipation, although diarrhea may occur, with vomiting during acute exacerbations. No blood is found in the stool as a rule, and leukocytosis is present. Often a mass is papable. This patient could have diverticulosis, but ordinarily an x-ray of the bowels will clinch the diagnosis by the characteristic findings.

One could imagine that an infestation of the colon with a long standing attack of flagellate infection might cause diverticulitis, through infection, ulceration, and colitis. And this could occur. However, in considering flagellate infection, one must be very cautious in trying to prove a case of diarrhea as due to flagellates. Here we do not know just what type is present, the Trichomonas hominis, Chilomastix or the Giardia. The exact relationship of the two former to diarrhea is doubtful in the light of our present knowledge, (but at times, the Giardia can and does produce severe diarrheal symptoms, even dysentery. In severe Giardia infections, the stools contain mucus, blood and sometimes pus, there are colicky pains, tenesmus, marked anemia, weakness and digestive disturbances. Even then, however, the diarrhea may not be due to the flagellates, but another condition present might cause the parasites to appear in an active condition in the stool. It has been proved that any inflammatory condition of the bowels favors a flareup in the number and virulence of an otherwise quiet infection; conversely, many observers still believe that many cases of flagellate infection per se do not get marked pathological effects, but when present in large numbers, may keep up or make worse a condition produced by another cause. However, when recognized, the removal of these flagellates generally benefits the patient, and often causes amelioration of symptoms. With this patient, I believe, in the presence of other findings recorded, that the flagellate infection is only a minor consideration to the main issue.

From a consideration of the foregoing discussion, I am now ready to offer a diagnosis without much further comment. I have not said anything about malignancy of the bowels, and it is in this suggestion that I am pinning my hope for a correct diagnosis. I believe the patient had a malignancy, probably originating in the splenic flexure of the colon, and probably extending to some of the adjacent structures, with flagellate infection of the bowel also. In addition, of course, the findings given contribute other subsidiary diagnoses; right sided hemiplegia, secondary anemia, and cachexia.

I am at a loss to explain the chills and fever which the patient had prior to operation. It is undoubtedly a septic process and may have originated from perforation or some other infective process at the site of the tumor, possibly with abscess formation there. The hemiplegia too is difficult to explain. Its onset was not typical for hemorrhage. The onset was fairly typical for thrombosis of one of the arteries, because, in this condition, we sometimes get premonitory signs, with headache and motor weakness, low blood pressure usually and never signs of increased intracranial pressure. Metastasis of a malginancy could account for the hemiplegia also, as could a metastatic abscess. Just

which one accounts for this condition, I am unable to state.

OPERATION

On October 14th, under sodium amytal anesthesia, a left rectus incision was made. A large tumor mass, which was freely movable and could be raised up from the underlying structures, was found. The spleen was normal in size and the liver was normal in size. There was no evidence of any metastatic tumors or glands in the liver, omentum, mesenteric glands nor in the pelvis. The colon and stomach were firmly adherent in the tumor mass. The entire mass seemed friable and bled easily. The right kidney was normal but the left kidney could not be palpated and the diagnosis was thought to be polycystic kidney. So the abdomen was closed at once.

REPORT ON AUTOPSY

At autopsy the abdomen was opened and the omentum was firmly adherent to the abdominal tumor. There was a large friable mass which seemed to involve the transverse and descending colon and was adherent to the fundus of the stomach. The left kidney was separated out of the mass and was perfectly normal. There was no evidence of any metastasis in the liver, spleen, or pelvis. The head was not opened.

Pathologist's Report: The gross specimen consisting of a portion of the transverse colon and pancreas. This colon tissue was involved in extensive necrosis and in some portions the entire wall of the bowel was destroyed. Other areas showed nodular destruction. Sections of these nodules showed characteristic cellular structure of adenocarcinoma. The pancreas was involved in the necrotic process but apparently the new growth originated from the colon.

## COMPOUND FRACTURE WITH GAS BACILLUS INFECTION: RECOVERY.

A. C. KINGSLEY, M.D.,
Phoenix, Arizona

(Case Report to Staff Meeting of Good Samaritan Hospital, on Feb. 23, 1931.)

American boy, white, aged 9, living about seven miles from Phoenix. On January 21, 1931, at about 4:30 p.m., while riding his pony was struck by an automobile and thrown to the ground. He was taken home, and received first aid by a physician neighbor. He was taken to the hospital at 9 p.m., and examination revealed a punctured wound in the right popliteal space with considerable swelling around the knee and an evident fracture of the femur close to the knee. He was in shock. 1500 units tetanus antitoxin was administered and the leg put in a splint. An x-ray order was given. The following morning, when seen at 8 a.m., his temperature was 100, pulse 120; there had been considerable bleeding during the night and he was in some pain. As the pictures had been taken, it was decided to wait until they were developed before proceeding with the reduction of the fracture.

Shortly after 9 a.m., I was called to the laboratory to examine the films which showed compound, comminuted fracture at the lower end of the femur, with evidence of gas formation in the soft tissues, extending along the posterior portion of the leg as far as the upper margin of the film. Examination now showed a foul discharge from the wound in the popliteal space with the characteristic odor of gangrene, and with crepitation along the outer aspect of the thigh, which was also very markedly swollen.

Following consultation with Drs. Greer and Goodrich, immediate operation was decided upon and performed at 11 a.m. The thigh was laid open with four longitudinal incisions, and tubes were inserted through the wounds, which were irrigated every thirty minutes with Dakin's solution. Following the operation, 50 units of gas gangrene antitoxin were given intravenously and 50 more in the muscle of the thigh. This dose was repeated the following day. On the 24th, 25th and 26th, 100 units were given intravenously and 100 units in the thigh.

On the 23rd, the pulse was 132, temperature 101, and respirations 30. There was a large amount of discharge from the wound, but the odor did not seem so pronounced. He suffered considerably from urticaria after the injections, but had slight reaction. The odor and destructive process disappeared within the week, from which time he made uneventful recovery as far as the gangrene was concerned.

He appeared at the office a few days ago. The wounds have practically healed, the fracture is firmly united and he is beginning to use the leg. In closing, I wish to say that our first intimation of serious trouble was shown by the pictures. The boy was kept at home five hours, and because of his condition on entering the hospital, it was thought best to wait until morning to take the pictures. This was fortunate, for had they been taken earlier, the gas would not have been discovered until symptoms of the infection developed, probably too late to save the boy's life.

## Discussion of Case and the Use of the Steinman Nail in Fractures.

JOSEPH M. GREER, M.D.
Phoenix, Arizona.

This is a case of compound fracture of the lower end of the right femur. It was more than that, it was a comminuted fracture with quite a large loose piece of bone, and, in addition, a gas bacillus infection.

In this particular case it was first thought, as so many times is done in compound fractures, that the first thing to do was to treat the wound and clear up the infection and then to take care of the fracture. Upon second thought it was decided to put in a Steinman nail and get as good position of the bone fragments as possible while treating the infection and wound. This later was proved to be the correct procedure. Therefore the nail was inserted in the lower fragment of the femur at the time of operation in which the muscle sheaths were opened in order to treat the gas bacillus infection. Care was taken to insert the nail above the epiphyseal line in the lower fragment yet as close to the lower end as possible. This point is very important in children because, if the nail is inserted through the epiphyseal line, there is danger of pulling off the epiphysis entirely or interfering with the future growth of the bone. Traction was then made with the thigh and leg in the vertical position, with a Thomas arm splint for additional support laterally and anteroposteriorly. The clevis for the Steinman nail was fastened anterior to the knee and it just so happened in this case that the weight of the leg acted as a lever with the nail as a fulcrum and caused a slight backward displacement of the lower fragment. This was remedied by removing the clevis from the nail and applying the traction by means of a wire up over the sole of the foot over a spreader block allowing the leg to assume a more extended position with the knee straight. The weight of the leg was also supported by means of mole skin traction. This readjustment had a tendency to pull the lower

fragment forward into better position. It was very fortunate that the nail was used in this case as in less than three weeks' time the union was very firm.

It would seem that the Steinman nail is most invaluable in the treatment of many compound fractures, as it allows reduction and the maintenance of position while the wound is being treated. It facilitates the care of the wound by allowing treatment and dressings without the danger of getting the fragments of the fracture displaced. It used to be the policy of many surgeons to treat the wound first and when the infection was cleared up, or it was found that there was going to be very little trouble with the infection, attention was then turned to the treatment of the fracture. It would seem that many times this procedure is not the best, and would have no doubt resulted in malunion in the above case which would have necessitated secondary operation. The sooner the fracture can be reduced and the better the fragments can be held in position the better our results are going to be.

For example, a compound comminuted fracture of the leg with marked laceration of the muscles, skin, etc., was treated on a Thomas splint and traction was maintained by means of a Steinman nail through the os-calcis. He is walking now with very little limp and only about one-quarter inch shortening. I do not know of any other way in which these fragments could have been held even close together. As someone around the emergency room that morning said, he came in with his foot in his hip pocket, and the leg felt like a bag full of loose rocks. Therefore it would seem that we should consider this method of securing and maintaining reduction in our compound fractures more than we do.

In many cases of simple fracture the use of skeletal traction by means of the Steinman nail is of value. For example, spiral fractures of the tibia; we all know how they have a tendency to rotate and override. Very frequently this can be prevented and good position can be had by means of a nail through the os-calcis. As to infection caused by the nail. This is possible of course. There is usually a little drainage from the soft parts after removal of the nail for a few days. I have never seen an infection that amounted to anything from the use of the nail. I might say that I have from the use of the tong however.

It is not always so easy to sell the idea to the patient, however. Well I remember one case that discussed with his friends and his family physician, for two days, my cruelty and insanity for suggesting such a terrible thing as the driving of a nail right through his heel. He consented, however, and got a good result. Another patient, a femur case, wanted to know if such a thing had ever been done before. When he was told that it had been he wanted to know how soon the patient died afterwards. However, the pain of the nail is very little and the danger of serious infection is very remote.

In concluding my remarks, I might say that it is believed that skeletal traction by means of the Steinman nail is valuable in the treatment of many compound fractures; it facilitates the holding and controlling of the fragments and the dressing of the wound; the danger of infection is really not a danger at all. The patient is very comfortable. The nail is also valuable in holding many simple fractures that cannot well be held by the application of skin traction and the application of splints.

## REPORT OF DEATHS IN GOOD SAMARITAN HOSPITAL (PHOENIX) FOR JANUARY, 1931.

(February Staff Meeting)
J. D. HAMER, M.D.

There were about three times as many deaths on the medical service last month as on the surgical service, and none on the obstretrical service, and, on the whole, the charts were quite satisfactory for review. An attempt to elaborate even the salient points of each case would make this report entirely too long, in view of the fact that there were seventeen deaths last month. There were three autopsies recorded, two on medical cases, and one on surgical.

Case 10665 was a male of 72 years of age, who died of cerebral hemorrhage of the left side after six days in the hospital. The diagnosis was confirmed by autopsy, and, in addition to a left cerebral hemorrhage with extensive involvement of the cerebral cortex, there was found arteriosclerotic disease of the kidneys, passive hyperemia of the liver and both lungs at the bases, and generalized arteriosclerosis. Case 10478, also a male, of 62, expired of right-sided hemorrhage, after a residence of nineteen days in the hospital. This patient, in addition to the signs of cerebral hemorrhage, showed a decided dementia, and certain features of the case made the diagnosis of gumma of the brain probable, but a thorough study of the case indicated that this was not the cerebral lesion in question. Case 10578 was a male of 34, who expired two days after admission, with a diagnosis of cerebral hemorrhage. The information as given on the chart was rather meager, and in view of the age of the patient (34), it would have been interesting to know what was the cause of this cerebral accident.

Case 10379 and Case No. 10526 were burn cases, the former a child of 4 years, and the latter a child of 13 years.

Case 10294 was the case of an orderly in this hospital who succumbed to a lingering illness of typhoid fever. The diagnosis was confirmed by positive Widal. The source, or probable source, of his infection was not disclosed.

Case 10457 was that of a female of 51, who died on the fourth hospital day, and while her history and complaints would point to the pelvis, because of pain and excessive bleeding, a study of the case indicated to the physician a diagnosis of endocarditis, pyelonephritis, septicemia, adenoma of thyroid and bronchopneumonia. An autopsy on the body virtually confirmed the diagnosis, as, bilateral pyelonephritis as the primary cause of death with bilateral bronchopneumonia, mitral stenosis, chronic passive congestion of the viscera, and multiple myomata of the uterus, as contributory causes. A blood culture was not reported.

Case 10561 was a male of 45, who died of lobar pneumonia. Case 10704 was a male of 77, who expired of hypostatic pneumonia, chronic mitral valvular disease, myocardial degeneration, cystitis, and duodenal ulcer. Case 10546 was a male of 60 who expired of bronchopneumonia.

Case 10540, a female of 44, had a diagnosis of encephalitis, secondary to influenza. This was an interesting case, in many respects. She had had meningitis at the age of six, and had lost one brother and three sisters of the same disease; one brother is living, who also had meningitis; while the mother had died of tuberculosis. The present history was that of recurring severe headaches, fever, and acute attacks of mania, since Jan. 26—two weeks before admission. The physical findings of

a positive nature were rather meager, there being recorded a blind left eye, tenderness in back of the neck, an irregular heart and respiration, and tenderness over entire abdomen. The laboratory reported 840 cells in the spinal fluid, globulin greatly increased, negative Wassermann on the fluid, and no bacteria. White count was 29,800, with 95 per cent polys. Urine showed three plus albumen, bacteria, 2 to 5 red blood cells, and 5 to 10 white blood cells, and a few myalin casts.

Case 10462 was a male of 34, who expired of pulmonary tuberculosis.

Case 10698, was a child of 8, who expired about 36 hours after an operation, and before an adequate post-operative study could be made to make a diagnosis. This child had been sick a week, and was brought into the hospital with a history of having nausea, fever, delirium, night sweats, and absolute neglect so far as care was concerned at home. The child was in extremis upon admission, and, while four physicians were examining her and consulting, fluids were being administered and other measures carried out for the relief of her symptoms, especially the abdominal distention, dehydration, and acidosis. The child was operated for probable appendicitis, in view of her findings, and consensus of opinion of the physcians who saw her. However, no appendicitis was found and no other abdominal disease, except an excessive amount of fluid in the peritoneal cavity. The white count was 5,600, with 82 per cent polys. The child expired several hours later, and subsequent examination revealed no localizing signs that would point toward a diagnosis. It was thought that the most probable diagnosis was an influenza of the gastrointestinal system.

Case 10625 was a male of 24, who was operated upon for an inguinal hernia on Feb. 18, and subsequently developed a bronchopneumonia, and expired on Feb. 22.

Case 10404, a child of 10 years, expired on Feb. 5, ten days following appendectomy. At the time of operation the appendix had ruptured, and fecal fistula followed, with subsequent loss of life through toxemia.

Case 10670 was a male of 16 years, operated upon for a ruptured appendix, who expired on the fourth post-operative day. This case, like the one just mentioned above, was not seen in time to operate sooner, and both were in very bad condition on entering surgery. This case, soon after the operation, developed signs of obstruction of the bowels.

Case 10548 was a male of 43, who entered the hospital first on July 14, and was discharged on August 11, much improved after the performance of a very extensive thoracoplasty. The patient suffered from pulmonary tuberculosis, tuberculous empyema, and thoracic fistula. The empyema had developed following a spontaneous pneumothorax in May, 1930, and the thoracic fistula remained after drainage of the empyema, done three weeks before this first admission. The patient re-entered the hospital on Feb. 10, for further rib resection, in an effort to eradicate the remaining portions of the ribs on the affected side and to secure adequate drainage. Operation was done under ethylene on Feb. 11, and patient expired the night of that day, apparently from shock in the third degree. An autopsy on the case made the diagnosis of chronic tuberculosis of the left lung with almost complete collapse, chronic pericarditis with adhesions, and dilated right heart.

## A CASE OF PELVIC TUBERCULOSIS WITH GENERAL EXTENSIONS

R. J. STROUD, M.D.
Tempe, Arizona

(Presented at the meeting of the Maricopa County Medical Society held Jan. 26, 1931.)

Patient, an American female, aged 32, married, with three children. Occupation: housewife.

Past History: Was always well and strong, having the usual childhood diseases but no serious illnesses. Three months ago, while in New Mexico, began to be nervous, lost weight, and became irritable—all described as a nervous breakdown. Patient flowed for three weeks, stopped for two weeks, and began again. Has done this more or less ever since. She has grown more nervous and weaker ever since and has lost 25 pounds in weight. Weighed 128 pounds at that time.

Was seen by me for first time on Sept. 7. Had been seen by physicians since coming to Arizona and was told that she was tired and worn out and anemic. She had never been examined, even for the taking of the pulse. When seen by me she had a temperature of 100. Was not conscious of having a rise in temperature and said that she could have that much fever, or more, without being aware of it. She believes she had no chance for pregnancy. She has had clots and lately a little bit of odor from the vaginal secretions. At this time and after examination, she was told that she might have to undergo an operation but wished to avoid it. Treatment seemed to give her relief immediately. On Sept. 18 she weighed 91 pounds and had no fever. There never was any back pain or tenderness at any time. On Sept. 20, she began having chills and fever again with temperature as high as 103. But gradually improved after being given sedatives, until Sept. 28, when she had chills and a rise of fever to 104. At this time she was told an operation was imperative and was ordered to the hospital. Pulse, 85 to 105; respirations, 18 to 20.

Physical examination: Age, 32; height, 5 feet, 5 inches; weight, 91 pounds. Patient looks pale; face pale and anemic and waxy in appearance. Eyes react to light and accommodation. Tonsils present but not diseased. Teeth, good; no enlargement of neck; chest essentially negative. Blood pressure, 104/70; heart somewhat rapid but not enlarged. No murmurs. Abdomen slightly spastic all over with a decided board-like appearance above the pubes and at the left and with the feeling that there is a mass below; this mass is very tender. During the period she was ill there was pain over the left side, felt more particularly just inside and below the iliac crest and seemingly within the bone. This pain was transmitted down through the front of the left thigh and was continuous; the left thigh in anterior portion was swollen and board-like along the middle third, 6 inches long and 3 inches wide. This peculiar mass has been constant by bimanual examination. At first impossible to examine because of pain. Finally demonstrated a mass to left of median line which was tender to touch. This mass was larger at each examination last 5 days. Uterus appeared longer than normal and could have been an early pregnancy. On the first examination, dark bloody material was found on the examining finger and had slight odor. Since that time there has been no secretion. Cervix appeared normal. Bones and joints normal; there is no tenderness in the sacro-iliac region around the joints and no pain is complained of at this place. Urine essentially negative except for hyperacidity. Blood count not taken before entering hospital.

Diagnosis: Some inflammatory mass situated at the region of the left fallopian tube.

Operation: Laparotomy. Mid-line incision from unbilicus to pubes. At the left side there was a large mass of intestines bound together by adhesions, with a mass of mesentery bound up with the rest, as large as a hen's egg. In separating the mass, a pus pocket, under some tension, was found lying above the left fallopian tube. Some two ounces of pus were removed and two drains inserted. The tubes and ovary were not seen, as a strong wall of adhesions was between the cavity and these organs. The patient's condition did not warrant further investigation.

She had a stormy time and was supported by fluids. On the eighth day she became conscious of her surroundings and did not quite remember how she reached the hospital, the toxemia being very profound at the time of her entry. On the twelfth day the nurse reported an enema came through the abdominal wound, establishing the fact of a fecal fistula. After three weeks the patient returned home, the wound still draining; the drainage, however, being almost entirely of fecal matter. The skin at the line of incision gradually spread, and the patient had periods when there was very little drainage and she felt better during this time, except for the last two or three days before the drainage became profuse; she would then have an immense amount of drainage, following a rise in temperature and malaise.

Dr. Milloy saw her with me in consultation at the end of November. She had had ten good days before he saw her, and he advised direct sunlight on the wound. This seemed to give her some relief. He further advised against any radical procedure at that time. About the middle of December the patient ran a high temperature and complained of a pain in her right side which proved to be pleuritic, and as she had had more or less continuous fever, her lungs were gone over thoroughly and a diagnosis of a fibrous type of tuberculosis was tentatively made. At this time it did not occur to me that this had anything to do with the lack of healing of the fistula. At the time of the first examination and during the first two weeks, the cervix was seen three or four times and appeared quite normal.

Some ten days ago Dr. Ploussard saw the patient with me and was very suspicious and asked about a Neisser infection. It was my idea that such was not the case; my diagnosis, from the history of the bleeding and general course of the case, was that of a ruptured tubal pregnancy, and that some infected material from the tube had found its way into the abdominal cavity, making a localized abscess. It was decided before anything radical was done, at least to get an x-ray of the intestines, and by this method see just where the fistula was. Doctor Ploussard examined the cervix, took a smear and thereby made a surprising discovery. The cervix, at this time, was swollen, reddened and looked like a beefsteak, with some pus exuding. The patient did not menstruate during this time. I was much surprsied when Dr. Ploussard told me the smear contained tuberculosis organisms, as this is quite an unusual find.

After this diagnosis I looked at the wound where the skin had separated, and the picture of granulations in the musculature was that of a more or less characteristic pharyngeal tuberculosis. The diagnosis, therefore, is miliary tuberculous. It is possible that there was some tuberculous trouble with the tube, and a ruptured tubal pregnancy, perhaps, lighted the whole picture.

I should like to call your attention to the early history. This woman and her husband both told me very distinctly that she had been seen by physicians both in Albuquerque and in Arizona many times, none of whom ever made any examination, so that the early part of her history is really obscure.

### DISCUSSION

DR. C. N. PLOUSSARD: I saw this case in consultation with Dr. Stroud, January 16th last. Patient a young female, lying in bed, very thin, anemic, showing signs of a long drawn out toxemia. Dr. Stroud has given you the findings obtained by a thorough physical examination, so it is not necessary for me to repeat.

During the course of physical examination a cervical smear was obtained because of the profuse watery vaginal discharge and the edematous, granular, eroded appearance of the cervix. Bimanual examination did not reveal any definite tender masses, although tenderness was general in region of uterus and its adnexa. The laboratory stained cervical smear with Gram's stain and, finding many rod-shaped bacilli, decolorized stain and restained for tubercle bacilli and found large numbers of acid-fast bacilli, morphologically tubercle bacilli.

Because of the downward progress of patient's condition, showing signs of an infective process in pelvis together with a fecal fistula apparently high in small intestines, causing apparent signs of starvation, an opinion as to further surgery was indeed difficult to arrive at. But the question was easily settled when an explanation of the entire illness was revealed by the laboratory findings in examining cervical smear.

This patient, no doubt, has a generalized tuberculosis. She has cough, elevations in temperature and rales in chest. The symptoms referable to the gastrointestinal tract are those of chronic infection, no doubt, tuberculous, and the pelvic infection is, without doubt, tuberculous.

Prognosis is indeed grave. The patient probably will gradually become weaker until death ends the scene.

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## CASE REPORT AND DISCUSSION
## (Headache and Dizziness)

(Case 16301, Case Records of Massachusetts General Hospital, from New Eng. Jour. of Med., July 24, 1930, p. 174.)

### Case Report

A Russian thirty-eight years old, a restaurant counter-man, entered January 10 complaining of headache. He had some language difficulty, was markedly slowed mentally, and dropped asleep if his attention was not held. He seemed quite intelligent, however, and the history was thought to be reliable except in details.

December 15 he first noticed headache and periods of dizziness. The following day the headache was so severe that he had stayed in bed since that time, going out for his meals. The headache had always been frontal, but had occasionally radiated over the brow to the right. He had periods of dizziness lasting five minutes on getting up. Since the onset the sight of food had nauseated him, and until a week before admission he had had a very bitter or sour taste in his mouth on seeing or tasting food. On December 17 he vomited from six in the morning until noon. On December 19 he vomited two or three times and on December 21 once. For two weeks his appetite had been very poor. Two weeks before admission on getting up everything went black before his eyes for several minutes. A week before admission he found that after reading for a few minutes the print looked like

a solid black line. At the same time he noticed a buzzing in his left ear. Since the onset he had had increasing weakness.

All his life he had had attacks of extreme nervousness and irritability, for which he had frequently been beaten. Eleven years before admission he had an attack of palpitation and marked dyspnea. He spent two months on a farm and had had no more of that trouble. Between one and two years before admission he had night sweats and severe cough for two months with considerable reddish-black sputum, on one occasion blood streaked. A physician advised him to go to a hospital. He spent two months in the mountains and gained fifteen pounds. He denied venereal disease and the use of alcohol.

Records of the Out-Patient Department show that he came on August 24, a year and five months before admission, complaining of vague chest pains, dry throat, occasional huskiness and rare dry cough of two months' duration, keeping him from working as a porter. He had gained eight pounds in two months. Examination was negative except for possible fullness over the suprasternal notch. A Hinton was negative. X-ray examination showed several small rounded shadows of increased density with sharply defined margins in both lung fields. At the angle between the heart and the diaphragm on the right there was a large area of increased density which obliterated the outline of the right border of the heart and the diaphragm. The costophrenic sinus on this side was hazy and shallow. There was no evidence of cavity. The heart shadow was roughly triangular in shape, somewhat increased in size. On September 7 he reported feeling better, and on October 5 very much better. He had been working for three weeks. He now had a vague substernal distress on getting up in the morning. Examination was negative except for flatness throughout the abdomen except over the stomach, probably due to obesity and fluid in the intestines. October 19 he complained of more or less continuous pain at the base of the skull and in the frontal region, worse in the morning. November 16 the pains in the chest had returned, forcing him to stop work. He told of coughing up blood several months ago. He had lost four pounds in two weeks. Another x-ray examination showed that the process in the chest previously described had largely disappeared. The only variation from the normal still present was thickening about the right hilus and the right descending bronchus. November 23 he felt very well, had gone back to work and had regained the weight he had lost. He was referred to the Pulmonary Clinic, but did not report there, and was not seen again for eight months. July 15, six months before he entered the wards, he returned to the Out-Patient Medical Clinic. He had felt very well and had worked steadily without symptoms until a week before the visit, when after lying out on the beach for three hours he had pain in the left flank which had grown worse. It was aggravated by motion and radiated up the left costal margin. He had pain when he lay on the left side, but was comfortable on the right side. Examination showed pallor and a palpable mass, presumably the kidney, in each flank after deep inspiration. The liver edge was one to two centimeters below the costal margin. The knee jerks were sluggish, the ankle jerks not obtained. July 29 he reported that the pain gradually passed off in a week. He had had slight pain in the right side of the throat for two days. Examination showed small ragged tonsils, probably chronically infected, and a palpable slightly tender gland in the right anterior chain. He was not seen again until January 2, eight days before he entered the wards. His chief complaint was then dizziness. He was referred to the Eye Clinic. Examinatoin of the external eyes was negative.

Clinical examination showed a well nourished man with slightly pale and yellowish skin, dry on the insides of the upper arms and markedly cornified on the feet. Face asymmetrical; right lower jaw higher than left and distance from midline to right center of the mouth less than to the left. Palate deviated to the right. (He insisted that he had had the facial asymmetry all his life.) The left lung showed slightly diminished resonance throughout the back. Descent of the right lung slightly less than that of the left. Apex impulse of the heart seen and felt 9 centimeters from midsternum, one centimeter outside the left border of dullness. Occasional doubling of the diastolic sound at the apex. No other abnormalities were found on general physical examination.

Neurologic examination. Fundi: bilateral papilledema. Left facial weakness. The eye did not seem to be involved. Tongue protruded in the midline without tremor. Knee jerks obtained on reenforcement only; otherwise the reflexes were normal. Grips equal though rather weak. Co-ordination tests well done. All sensory tests normal.

Urine: amount not recorded; findings normal. Blood: hemoglobin 80 per cent, reds 3,910,000, leukocytes, 15,300.

Temperature 96.1° to 98.4°, with a terminal rise to 104.4°. Pulse and respirations normal except for a terminal rise to 100 and 31.

X-ray examination of the skull was negative. The sinuses showed moderate thickening of the lining membrane without retained secretion.

A nose and throat consultant reported on January 10, "The nose shows marked swelling of the right middle turbinate and the inferior turbinate. Membrane pale and boggy, with secretion on the right side."

January 11 the patient showed an unsustained horizontal nystagmus. There was no suggestion of Romberg. Examination of the visual fields and acuity was of little value because the patient was unable to follow directions.

January 13 he complained a good deal of headache. A lumbar puncutre was done in the fourth-fifth lumbar space, and 12 to 14 cubic centimeters of clear colorless fluid withdrawn under increased pressure,—initial pressure 260, combined jugular pressure 630 to 270, final pressure 70. The headache was much relieved after the withdrawal of a few cubic centimeters. The fluid showed no cells; alcohol, ammonium sulphate and Hinton tests negative, total protein 74, colloidal gold 5443332110, sugar 75.5, chlorides 720. That day a nodule was palpated under the left costal margin, and a mass descending from under the right costal margin on deep inspiration. The next day the patient complained of right occipital headache radiating forward to the frontal region, and said he had not slept all night. The following morning he was found unconscious and could not be roused. He was sweating profusely. The rectal temperature was 103°. Two hours later he was still unconscious, flaccid, with absent tendon jerks and no response to plantar stimulation. The right pupil was five millimeters in diameter, the left two millimeters. Neither reacted to light. The breathing was easy and rather rapid. Numerous coarse moist rales were heard at both bases. Another lumbar puncture done in the fourth-fifth lumbar space gave 12 cubic centimeters of colorless opalescent fluid under an initial pressure of 410, combined jugular pressure 700 to 410, final pressure 35; cells, 6 lym-

phocytes, 7 mononuclears, 678 red blood cells; alcohol positive, ammonium splphate negative, sugar 78.6, chlorides 734.

That day, January 15, the patient died.

**Discussion by Dr. Howell Randolph, Phoenix, Ariz.**

The difficulties of diagnosis in this case do not depend upon an insufficiency of symptoms and clinical data, as is so often the situation. The history goes pretty clearly into the past year and a half of the patient's life, with observation records. Findings at different times point to the abdomen, the lungs, and the central nervous system, with intervals of complete remission of symptoms, making the task of correlating the various conditions rather complicated.

The presenting symptom is headache. A satirical humorist has observed that not every headache was an indication of brain tumor; however, this one had been continuous for 25 days and had been associated with other symptoms, such as attacks of dizziness, nausea, disturbances in taste sensation, transient loss of sight, with aberrations of vision, all of which tend to support the idea that there is some intracranial disease.

Before going further into the immediate findings, the records of the past history are interesting, if rather confusing. Undoubtedly there was some serious pathology in the lung two years before. These symptoms of vague pains in the chest, sputum sometimes blood-tinged, night sweats, together with the x-ray findings, might represent tuberculous or syphilitic infection, lung abscess, non-specific infection, or malignancy, with probabilities against tuberculosis.

This process underwent resolution, as shown by subsequent x-ray, which makes me think that it was not malignancy, and probably not tuberculosis, but either unresolved pneumonia, abscess, or syphilis. There was apparently complete remission of symptoms. A year later palpable masses in the flanks, with pain on the left side sufficient to bring the patient to the clinic, were found six months before admission, but no mention is made as to the extent of the trouble. Possibly essentially normal kidneys might have been palpated. The difficulty cleared up in short order and patient was apparently well until about three weeks before admission to the hospital. A description of the loss of sight would have been helpful. Did the patient lose consciousness during it? If so, simple fainting would account for it. Was sight lost more completely or suddenly in one eye, or, in both at the same time?

Nothing further was said about the condition of the kidneys on admission and the fidings in the lung were reported as essentially negative. The general physical examination showed nothing of significance if the facial and palatal asymmetry is to be considered congenital. The neurological data were of chief importance. Papilledema means definite marked increase in intracranial pressure, as corroborated later by spinal puncture. Left facial weakness and sluggish knee jerks were the only positive findings. Three days later, masses were palpated under both costal margins.

The death of this patient was undoubtedly caused by some intracranial lesion. It was located, probably, on the right side in the frontal or temporal regions. The headache was always right-sided. The right pupil was dilated. Tuberculoma is rare over 15 years of age. There is no evidence of middle ear or other focus of infection causing abscess. No fever except terminal. The Wassermann or Hinton is practically always positive in central nervous system syphilis, and there are none of the other findings which go with syphilitic lesions, except possibly gumma, which could be present with very little in the general findings to differentiate it from other lesions. However, with a negative blood and spinal fluid Hinton, it is very unlikely. The gold curve is not typ icfaolmoykdue cmfwyp curve is not typical of generalized syphilis or paresis. In paretics the first four or five tubes show complete color changes. The gold curve, being dependent upon globulin changes, would run parallel to the increase in total protein in this spinal fluid.

Between 1 and 2 per cent of autopsies are done on brain tumor cases. One half of all brain tumors are gliomata consisting of hyperplasia of the neurologial groundwork of the brain substance. The whorl endotheliomata are less common and less malignant. Fibromata originating in nerve sheaths occur and are more easily diagnosed than the previous two mentioned; usually are benign. They represent a large proportion of the successfully operated cases. Metastatic tumors represent over 10 per cent of the brain tumors.

Diagnosis: I am inclined toward the belief that this is a secondary tumor of the brain, metastasis being from a hypernephroma on the left side. With extensive metastasis there should have been more wasting and generalized effects. There is not any marked reduction in hemoglobin. Primary brain tumor seems a likely possibility. Death was probably from hemorrhage into the brain following decompression, or from depression of the vital centers by changes in intracranial pressure conditions.

**Discussion by Dr. W. Warner Watkins, Phoenix**

We have three very common presenting symptoms: headache, vertigo and vomiting. It has been very profitable to me to review these three symptoms and it may be interesting to the Club to consider some of the fundamental facts with regard to them, and from the foundation thus laid, we may be able to proceed to a diagnostic conclusion, which may be sensible though it may perhaps not be correct.

Headache. This first presenting symptom certainly gives us a field wide enough to stretch in and roomy enough to arrange any ideas we may have. If we first make a systematic arrangement of the usual causes of headache, we have some fixed points to which we may return later. A fairly convenient classification of headache is into three groups (French):

1. Those caused by organic ddiseases in the head itself, such as lesions of brain, intracranial vessels, meninges, skull or special sense organs.

2. Toxic states, which may be either (a) exogenous, such as foul air, poisonous gases, drugs, and so forth, (b) edogenous, such as from uremia, cholemin, gout, diabetes, gastro-intestinal toximia, infectious toxemias, and so forth.

3. Functional, as from abnormal blood pressure, congestive, anemic, mental strain, eye strain, migraine, epilepsy, psychoneuroses.

Vertigo. A definition of vertigo (Grasset) is that it "is the symptom of functional insufficiency of the automatic centers of equilibrium." Equilibrium is maintained by a nerve center in the cerebellum as a reflex from certain stimuli coming over afferent fibers, and the transmission of efferent impulses to the skeletal muscles. The centers of equilibrium receive three sets of fibers, (a) vestibular from the semicircular canals through the auditory nerves; (b) visual from the retina through the optic nerve; (c) muscle sense fibers from Clarke's columns and the posterior columns of the cord. The centers send out fibers to (a) the Rolandic area of the opposite side, which act on the motor centers, (b) the oculomotor nerves gov-

erning the ocular muscles, (c) the anterior horns of the spinal cord and through them to the voluntary muscles, (d) bulbar centers and through these to the glossopharyngeal and pneumogastric nerves.

Normal equilibrium is the result of harmony of labyrinthine, retinal and muscular impressions. The usual causes of pathologic vertigo may be grouped into five classes:

1. Central, the most usual causes of which are arteriosclerosis, cerebral tumor, cerebellar tumor, disseminated sclerosis, paresis, and disturbed circulation in the centers, which may be either hyperemic or anemia; in this latter class are included the vertigo of common syncope, of menopause, of chloroneurosis, of anemia, of hemorrhage or of heart disease.

2. Aural vertigo, such as Meniere's disease, infections of the labyrinth, wax in the ear, and so forth.

3. Neuropathic, such as from neurasthenia, psychoneuroses, epilepsy.

4. Toxic vertigo, as from alcohol, tobacco, carbon monoxide, drugs, from uremia, cholemia, acetonemia, and so forth.

5. Reflex, or the so-called gastric vertigo, from stimuli coming over the pneumogastric nerve.

Vomiting. This is a reflex action, the result of afferent stimuli coming to the vomiting center in the medulla, with consequent efferent stimuli over the motor pathways. The afferent stimuli come over one of four pathways, and the causes of vomiting may be grouped accordingly.

1. Abdominal—stimuli coming over the pneumogastric nerve; includes indigestion, appendicitis, gastric neuroses, ulcer or cancer, hepatic or renal colic, pregnancy, intestinal obstruction, tabetic crises, cardiac disease with decompensation, and so forth.

2. Pharyngeal, from stimuli over the glossopharyngeal nerve. Throat irritation is a common example; the pathologic causes of this stimuli are infrequent.

4. Nasal stimuli over the trigeminal nerve; bad odors being a common example; migraine is another example.

5. Cerebral stimuli, arising from inflammatory, toxic or psychic causes or intracranial pressure. This includes the vomiting of meningitis, cerebral tumor or abscess, of diabetes from acetonemia, from cholemia, from uremia, onset of acute infections, alcoholism.

When we study these many causes of three very common symptoms, the list seems formidable, but a critical analysis of the symptoms in tabular form (q.v.), will soon show that we can narrow the causes common to all three symptoms down to a much narrower group.

Without going through all the motions, the final result is that the diseases which stand out as the most likely causes of all three symptoms are: (1) Organic brain disease, (2) arteriosclerosis, (3) nephritis with uremia. Other conditions come momentarily into the picture, but soon fade out, when attempt is made to cover all the symptoms by them. Those symptoms are: headache, dizziness, nausea and vomiting, history of some intrathoracic pathology of uncertain character, chest findings nearly normal, bilateral choked discs, left facial muscular weakness, normal urine and blood except for leukocytosis. Spinal fluid with evidence of increased intracranial pressure, slight excess of protein, colloidal gold tending to paretic curve, otherwise normal; second examination showing evidence of some bleeding.

| HEADACHE | VERTIGO | VOMITING |
|---|---|---|
| **Organic** | **Central** | **Cerebral** |
| Brain tumor | Tumor | Tumor or abscess |
| Meningitis | Arteriosclerosis | Meningitis |
| Arteriosclerosis | Dissem. sclerosis | Toxic (infections) |
| Periostitis | Paresis | Uremia |
| Sense organs | Circulatory | Cholemia |
| Sinusitis | | Acetonemia |
| **Toxic** | **Toxic** | Alcoholism |
| Foul Air | Alcohol | Psychic |
| Gases | Tobacco | **Abdominal** |
| Drugs | Drugs | Indigestion |
| Uremia | Uremia | Appendicitis |
| Cholemia | Cholemia | Gastric neurosis |
| Diabetes | Acetonemia | Ulcer or cancer |
| Intestinal | | Int. obstruction |
| Infections | **Aural** | Hepatic or renal colic |
| **Functional** | Meniere's dis. | Tabes |
| Blood pressure | Infections | Heart disease |
| Congestion | Wax | **Pharyngeal** |
| Anemia | | Irritation |
| Mental strain | **Neuropathic** | **Nasal** |
| Eye Strain | Neurasthenia | Odors |
| Migraine | Psychoneurosis | Migraine |
| Epilepsy | Epilepsy | |
| Psychoneuroses | | |

This history of chest lesion, producing cough, stained sputum, and so forth, does not fit in with the evidences which finally brought the patient to the hospital. They seem to have finally disappeared, and we must suppose that they are not related to his terminal illness. The same thing applies to the abdominal symptoms which he developed after lying on the beach for three hours.

Is this nephritis with uremia? The headache of uremia is usually frontal, as this was; nephritis causes a headache which is usually worse in the morning. Headache, vomiting, drowsiness, force us to consider uremia, but with normal urine in a comparatively young man, and without blood chemistry, we cannot diagnose nephritis.

Is this arteriosclerosis? Arteriosclerosis of cerebral arteries may cause headache which cannot be distinguished from brain tumor. However, we do not usually expect vomiting from arteriosclerosis until we have some sort of toxemia resulting. The spinal fluid findings cannot be explained by arteriosclerosis, and since this diagnosis seems to be an imperfect fit, when we set down the symptoms, we must reject it.

A favorite fictional detective of mine has a saying, that when we are faced with a problem and have eliminated the various possibilities, that which remains, however improbable, must be correct.

Therefore, we come up to organic brain disease, with the idea that we will find there the correct solution.

When we consult the chart of our three symptoms, we find that the only lesion common to the three of them—under the headings Organic, Cerebral and Central—is brain tumor. Will this lesion cover all the symptoms? The three cardinal symptoms of brain tumor are headache, vomiting and optic neuritis. We have these. The headache of brain tumor is usually worse at night, waking the patient in the morning; it may be frontal or occipital. This corresponds to what this patient had. The vomiting of brain tumor usually follows a change in position, and is said to be projectile. We do not have a very clear description of the vomiting in this case, but since the vertigo and vomiting usually go together, and the vertigo is said to have come on change of position, we may assume that the vomiting did also. The optic edema is consistent for brain tumor, being bilateral, indicating generalized intracranial pressure.

The peculiar symptom of the sight of food nauseating him, and the bad taste in his mouth is probably the anosmia of cerebral tumor. Since taste is nine-tenths smell, a subjective sensation of a bad smell could easily be mistaken by the patient for a bad taste.

The vertigo, or dizziness, coming with change of motion is consistent with cerebral tumor.

The spinal findings are those of an increased intracranial pressure without blocking of the fluid pathways. The pressure is high, and the relief of pressure and relief of headache following removal of fluid is typical; chlorides are normal, sugar, normal, total protein somewhat in excess. Colloidal gold is paretic type but with the goal of a proved diagnosis in sight we will not be turned aside by that suggestion. The second spinal fluid examination would indicate that there had been some hemorrhage.

Now comes the question as to whether this brain lesion is a primary growth, an abscess, a metastatic growth, a hemorrhage, or what not. Were the symptoms in the thorax which we have ignored the evidences of a primary new growth which has metastasized to the brain? Are the abdominal nodules a part of this same metastasizing process? There is against this the evidence that the lung lesions improved or disappeared. However, we will include this as our second choice.

Diagnosis: Brain tumor, with terminal hemorrhage into or around the growth.

**Discussion by Dr. Richard Cabot**
(Taken from journal as above)

"Everything went black before his eyes for several minutes." That is fainting. Anyone who was looking on would have said what else he did. But this is often all the patient's description of fainting.

I cannot make anything of his improvement after two months on a farm.

That attack one or two years before admission might perfectly well have been an attack of tuberculosis and it might perfectly well be a bronchitis or something quite different from either, that I cannot guess.

The Out-Patient record is a good deal earlier than we know of him here.

The gain in weight is surprising in view of the other symptoms. We should expect him to lose and not gain.

The fullness over the suprasternal notch makes us think of aneurysm or mediastinal glands.

Dr. George W. Holmes: This is the earlier film, the one spoken of as showing rounded shadows of increased density. Here are the shadows, very small, quite indefinite. Perhaps more important is the larger shadow which occupies the greater part of the region between the heart and the diaphragm on the right side in the region of the cardiophrenic angle. The heart shadow is apparently somewhat enlarged. We have no actual measurements or films taken for the heart. It looks a little large and triangular. We have another film in which practically all those shadows have disappeared.

These shadows look like metastatic nodules in the lungs. I do not think they would disappear if that is what they were. That looks like a bronchopneumonic patch. It may have been an infarct. The smallest shadows I do not know how to explain.

DIFFERENTIAL DIAGNOSIS

Dr. Cabot: Certainly the natural thing to think of first is a neoplasm somewhere. A neoplasm is suggested by his anemia and by these masses in the region of the kidneys or perhaps of the spleen and liver, we cannot tell exactly which, on one occasion said to be nodular. These brain symptoms, as you remember perhaps Dr. Wolbach told us the other day, very often come as a result of metastases of tumors elsewhere. If I remember, the tumor which was metastasizing last week at the Brigham Hospital was in the lung. If that second film belongs to another patient we might still say it is in the lung here. But the patient improved so tremendously at the time that we shall have to say that film is correct, and we have no evidence of disease of the lung. I think meningitis may be excluded. In the beginning pulmonary symptoms, ending up with cerebral symptoms, and the lumbar puncture showing no cells,—all that is very hard to make consistent with any meningitis. He is young for cerebral hemorrhage. We have none of the usual concomitants (in the way of focal symptoms) for serious hemorrhage. We have blood in the second tap fluid. I do not know whether the tpping was done in such a way that they could certainly exclude blood from the operation of tapping itself. We have to think of something that could bleed, and that could be neoplasm well enough. I feel quite uncertain as to what organ is the seat of the primary focus. It might well be a hypernephroma, though the metastasis is not characteristic. As to the brain symptoms, I should say they were from neoplasm, that he had marked internal hydrocephalus and symptoms due to that hydrecephalus.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Central nervous system syphilis?

DR RICHARD C. CABOT'S DIAGNOSES

Neoplasm, perhaps hypernephroma, primary focus unknown, with metastasis to the brain.

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**Pathologic Discussion by Dr. Tracy B. Mallory**
(From above journal, p. 177)

The autopsy showed some most unusual findings which are still puzzling us for a correct interpretation. A nodule of tumor five centimeters in diameter was found in the right frontal lobe. This was of unusual firmness and whiteness. Both adrenals were completely replaced by huge tumor masses which were in themselves almost wholly necrotic and filled with fluid hemorrhagic contents. The tumor in the left adrenal was about twice the size of that in the right and measured 25 by 15 by 15 centimeters. The tail of the pancreas was adherent to this mass.

At the time of the necropsy we jumped to the conclusion that we were dealing with a neuroblastoma, the commonest tumor of the adrenal medulla. This is frequently bilateral and typically metastasizes to the head. It is, however, extremely rare except in childhood.

The other gross findings of significance were a totally adherent pericardium and a nodule of metastic tumor in the right auricular wall.

Microscopic examination revealed our error and showed that we were dealing with two independent primarily malignant tumors. The tumor in the brain was a well differentiated, rather slowly growing, perfectly typical fibrosarcoma. This is a very rare primary site for a tumor of this character. The tumors of the adrenals, the tail of the pancreas and the heart were similar to each other in character but totally different from the brain lesion. They were extremely undifferentiated, very rapidly growing, largely necrotic. In some areas there was a recognizable alveolar arrangement and the cells could be identified as epithelial. This was particularly true of the tail of the pancreas, where the

appearances were entirely consistent with a primary carcinoma of that organ and the histologic findings did not at any point suggest any recognized type of primary adrenal tumor.

Dr. G. L.. Adamson: When the patient first came to the hospital a diagnosis of brain tumor was made; right frontal or temporal lobe. After we palpated the abdominal masses we had to think further, and the closest we came then was carcinomatosis. The diagnosis of central nervous system syphilis was made at death because of the colloidal gold reaction and before we had received the Wassermann reaction report.

ANATOMIC DIAGNOSES

Primary fibrosarcoma of the brain.

Primary carcinoma of the pancreas with metastases to both adrenals and the heart.

Adherent pericarditis.

## BACTERIOPHAGE AND BACTERIOPHAGY

Following the announcement, in 1921, by d'Herelle, of his studies into and his conclusions concerning, the "bacteriophage," the Journal A. M. A. (July 9, 1921) summarized in an editorial the developments in this astounding chapter of medical discovery, as follows:

"In 1915, Twort, of London (Twort, F. W.: Lancet, Dec. 4, 1915), while seeking evidence regarding nonpathogenic ultramicroscopic organisms found some unexpected results. While culturing calf vaccine, colonies of micrococci were obtained, from which subcultures could be made. On some of these, he noticed certain colonies became transparent from disintegration of the cocci. When material from such a dissolved colony was brought in contact with an ordinary colony, the process of solution would spread into the latter and often completely kill all the cocci in it. If material from a dissolved colony was diluted and filtered through porcelain, the clear filtrate had the power to dissolve cocci. This coccus-destroying virus can be kept alive through many generations of transfers, and cannot be grown independently of the cocci.

These observations suggested at once the existence of ultrafilterable viruses pathogenic for bacteria.

In 1917, d'Herelle observed similar phenomena in dysentery bacilli cultures, his observations being published in a series of short articles. This virus can be cultivated through repeated generations, and gives the impression of being a true ultramicroscopic organism, capable of multiplication, specifically pathogenic for the particular bacillus (Shiga in this instance). This attractive hypothesis has not been accepted without protest.

If the organic world has been built up slowly in accordance with the theories of evolution, an ameba and a bacterium must be recognized as highly developed organisms in comparison with much more primitive forms which once existed, and probably still exist. It is quite possible that an ultramicroscopic virus belongs somewhere in this vast field of more lowly organisms than the bacterium. It may be living protoplasm, or an enzyme.

Kabeshima thinks the bacteriolytic agent is an enzyme (Compt. rend. Soc. de biol. 83: 471, 1920), because a minute quantity causes very rapid lysis of large quantities of bacteria, it remains potent at least four years at ordinary temperatures, it resists the action of alcohol, chloroform, toluene, ether and phenol; the active agent may be precipitated from solutions with acetone or alcohol without destruction, and may be dissolved and preserved in glycerine; it resists temperatures that destroy bacteria and is not thrown out of solution by centrifugation. He thinks it is a catalyst which activates the autolytic enzymes of the bacteria.

Twort believes the agent is something formed by the bacteria themselves, saying, "There is this against the idea of a separate form of life: if the white micrococcus is repeatedly plated out and a pure culture obtained, this may give a good white growth for months when subcultivated at intervals on fresh tubes; eventually, however, most pure srains show a transparent spot, and from this the transparent material can be obtained once again."

D'Herelle is convinced the active agent is a true living organism which normally exists in the bowel, normally acting on the colon bacillus, but which may be an important defense against dysentery. He says he has cultivated a single strain through more than a thousand generations without loss of bactericidal property. Gjorup also accepts the view that this is a true filterable, ultramicroscopic virus pathogenic for bacteria."

Since 1921 it has been estimated that more than seven hundred articles have appeared on this subject, the great majority of them in the European journals. D'Herelle's second book has recently appeared containing his Lane Lectures at Stanford University, in October, 1928, bringing his own views up to date. The development of the researches into this agent or phenomenon has been very interesting and it is thought worth while to list some of the most important articles in the order of their publication, for the sake of a clearer view of this development.

Gjorup (Hospitalstidende, Copenhagen, Apr. 6, 1921) reviewed the published material and agreed that bacteriophagy represents a filterable virus growing on bacteria, and that Kabeshima's suggestion of catalytic action is not tenable.

Machado and Costa Cruz (Brazil-Medico., Dec. 17, 1921) and Pico (Revista de la Asoc. Med. Argentina, Oct., 1922) claimed the phenomenon to be due to ferment action from bacterial products.

Bail (Wien. Klin. Wchnschr., May 19, 1921 and Sept. 15, 1921) described the different conditions under which the "virus germs" would develop in cultures of dysentery bacilli.

Otto and Munter (Deutsche Med. Wchnschr,. Dec. 29, 1921), discussed the significance of the four ways of demonstrating the d'Herelle phenomenon.

Bergstrand (Svenska Lak. Handliger, Mch. 31, 1922) described the characteristics acquired by staphylococci after having resisted the action of bacteriophagum and stated this new discovery would upset many ideas regarded as established, as to heredity and bacterial variation.

Piorkowski (Med. Klin., Berlin, Apr. 9, 1922) called attention to the frequent transformation of hemolytic streptococci into the

viridans in the tonsils. Also to the spontaneous development of bacteriophagum spots on cultures of streptococci and thinks they are due to ferment action.

In J. A. M. A., for Nov. 11, 1922, editorial comment summarized the most important recent communications, as follows:

"Twort, and a little later d'Herelle, observed that when Berkefeld filtrates of the cultures of certain bacteria obtained from stools and other bacteria are added to cultures of dysentery or other bacteria, a solution of the micro-organisms often occurs. This reaction is referred to as the d'Herelle phenomenon or bacteriophagy. The nature of the solvent agent or bacteriophage, that is, the substance in the filtrates which has the power of dissolving bacteria, has not been definitely established. D'Herelle believes it to be a filtrable virus, a parasite of the bacteria themselves, because, when a portion of the dissolved cultures is added to a new culture, it, in turn, may go into solution. Moreover, agar subcultures of the dissolved or partially dissolved cultures reveal, as a rule, colonies of a shaggy, moth-eaten appearance, which have been called "sensitive" colonies, because the bacteriophage or lysant is present on the medium in which the growth occurs, in solutions in which the colonies are washed, and in suspensions of the disintegrated or ground-up bacteria.

Bordet was the first to advocate that the dissolving principle originates from the bacteria themselves, which, when touched by this active substance, are capable of regenerating it, the factor responsible for the phenomenon being thus unceasingly reproduced, on the condition, however, that the bacteria are still living and provided with the nutritive substances necessary to their growth. Bail and Watanabe, who also believe the phenomenon to be one of autolysis, attempt to explain it by an analogy with cell division, as exemplified in spermatogenesis; bacteriophagy is likened to the autolysis of the old nucleus prior to its reconstruction into two nuclei. This comparison is suggested by their belief that the dissolving agent is produced by the generative mass of bacteria rather than by the vegetative mass. Davison has recently made a study of the properties of bacteriosolvents, and his results lead him to believe that they are probably enzymatic in nature."

Again in the issue of Dec. 9, 1922, the following comment on other investigations furthem epitomized the subject:

"In a recent issue, different opinions of the nature of the solvent agent in bacteriophagy were cited. D'Herelle, who contends that the substance is a filtrable virus, and Bordet and Ciuca, who are just as firm in their belief that it is enzymatic in nature, report the production of antiserums that neutralize its solvent action. Bordet and Ciuca, inoculating rabbits with Berkefeld filtrates of dissolved cultures of Bacillus coli, obtained a serum which, on being mixed with active bacteriophages, prevented the solution of cultures of B coli, which now developed in the normal way. The antiserum neutralized the inhibitory and dissolving properties of the bacteriophage. An antiserum with similar action was produced also by inoculating rabbits with suspensions of so-called sensitive or deformed colonies. Bordet and Ciuca believe that these results strengthen their opinion that the active substance is a product of the bacteria themselves. D'Herelle and Eliava made experiments with B. dysenteriae (Shiga) and obtained a serum which inhibited lysis of the bacilli only temporarily, and they report the return of lysant power after the effect of the antiserum had passed away, which they hold supports their view that the lytic agent is a living parasite. Now Gratia and Jaumain also report the production of antiserum which, greatly diluted, inhibited the action of the bacteriophage temporarily; when more concentrated, however, its action was permanent. This may explain the results of d'Herelle and Eliava, who worked with high dilutions, 1: 1,000,000, of their serum. The antiserums obtained by Gratia and Jaumain against the bacteriophage active only for staphylococcus and another active only for B. coli were strictly specific in their neutralizing actions, while Maisin, in similar experiments, found the neutralizing effect to be non-specific. The conflicting results, which are characteristic of much of the work on bacteriophagy, should stimulate further experiments to determine more decisively the nature of the phenomenon."

Nelson Barbosa (Brazil-Medico, June 22, 1923) reports on the use of staphylococcus bacteriophage in furuncles, abscesses and pyelitis. Da Costa Cruz, in same journal, reported on use of bacteriophage by mouth in twenty-four cases of bacillary dysentery, and in subsequent issues of this Journal (June 23, 1923 and Sept. 29, 1923) discussed work which attempted to establish the nature of the phenomenon, concluding that "this research seems to suggest the ferment or antibody nature of this transmissible microbic lysis."

McKinley (Arch. Int. Med., Dec., 1923) administered bacteriophage in a number of ways with some degree of success; it was given subcutaneously, by duodenal tube, into wounds, on dressings, by ureteral catheter, intranasally, intra-aurally and by ingestion in amounts from 1 c.c. to 50 c.c., without bad reactions.

Costa Cruz (Comp. Rend. de la Soc. de Biol., Oct. 7, 1924) affirms that bacteriophage administration is the best treatment in dysentery available at the present time. It is given by mouth twice a day, each dose being 2 c.c. During the past year 10,000 boxes of bacteriophage have been distributed to physicians in Brazil. It does not neutralize the toxin and the Shiga antiserum may be required in addition.

Hauduroy (Ann. de Med., Paris, Oct., 1924) claims that many infectious diseases, such as dysentery, typhoid fever, plague or cholera, may be prevented or cured by bacteriophage. No more than two or three subcutaneous injections of 3 or 4 c.c., at twenty-four hour intervals, should be given, as otherwise sensitization might occur. Four or five doses of 10 to 20 c.c. of the pure or diluted bacteriophage are taken by mouth.

Bail (Deutsch. Med. Wochenschr., Jan. 2, 1925) showed that the destruction of bacteria is only one of the actions of bacteriophages. Production of resistance to bacterio-

phage results in bacterial mutation and growth of atypical forms of bacteria.

Hauduroy (Presse Medicale, Paris, June 13, 1925) affirms that in typhoid fever bacteriophage unquestionably plays a part in the process of natural cure, and can only be explained by lytic action of bacteriophage on the typhoid bacilli. In serial blood cultures, bacteriophage became progressively stronger and more active as the numbers of bacilli diminished in the blood stream.

Hadley (J.A.M.A., Aug. 29, 1925) concluded from his own observations that transmissible bacterial autolysis is widespread in the bacterial world; and while d'Herelle's hypothesis offers the easiest and most obvious explanation, other possibilities should not be entirely excluded.

D'Herelle (Comp. Rend., July 17, 1925) reiterates anew that the bacteriophage is a living corpuscular element, independent of the lysed bacteria, and that it displays the properties of assimilation and adaptation. He disagrees with Carrel who regards the bacteriophage as analagous with Twort's agent.

Sickenga (Nederland. Maandschr. v. Geneesk., Amsterdam, vol. 13, 1925) in a comprehensive study of bacteriophage in children's pyelitis, found it constantly present in the urine of four out of twenty-six cases. The course of the disease did not seem to be modified by the presence or absence of the bacteriophage. None was ever found in urine or feces capable of producing complete lysis of the corresponding bacillus in bouillon culture.

Wolff (Nederlandsch Tijd. v. Gen., Amsterdam, Sept. 12, 1925) does not believe the lytic action of trypsin is similar to the action of bacteriophage. Trypsin loses its action when diluted to 1:200, while bacteriophage is still active at this stage. He believes with d'Herelle that the bacteriophage-like action of trypsin is due to bacteriophage in the trypsin.

D'Herelle (Presse Medicale, Paris, Oct. 21, 1925) wrote on "The Bacteriophage in the Treatment of Bubonic Plague" a summary of his report appearing in the J. A. M. A., Nov. 21, 1925, as follows:

"In the Presse medicale, d'Herelle recalls that, in 1920, he isolated in Indo-China various strains of bacteriophages virulent for B. pestis bubonicae. One of these specimens, isolated at Bac-Lieu from the excreta of a rat after an epidemic of plague, was highly virulent from the start. After establishing that subcutaneous injection of the filtered bacteriophage culture caused no disturbance in the guinea-pig and subsequently none in himself, d'Herelle was about to employ the bacteriophage in the treatment of plague when he was suddenly recalled from Indo-China. He has recently applied the treatment, with good success, in Egypt, where he is the director of the maritime sanitary council and of the quarantine board. His report contains his observations in four cases of bubonic plague that developed on a steamer anchored in the harbor of Alexandria and treated by him in the quarantine hospital.

The bacteriophage cultures used in the traetment were prepared thus: To 10 c.c. of a culure of B. pesis bubonicae (cultivated in bouillon for twenty-four hours) was added 3 c.c. of fresh bouillon inoculated with 0.02 c.c. of a previously prepared bacteriophage culture of high virulence for the plague bacillus. After being heated in an autoclave for twenty hours at a temperature of 37 C., bacteriophagia being then complete, the clear fluid was filtered and the patients were inoculated therewith directly in the buboes. In the three cases in which the culture was injected within twenty-four hours following the appearance of the bubo, the general condition of the patients improved rapidly within a few hours after the injection. In the fourth case, the intervention not having occurred until the third day, no definite improvement was noted until a few hours after the second injection. These injections caused no local or general reaction. In addition to the expected bacteriophagic action in vivo, injection of the bacteriophage exerts an antitoxic action.

In 1921, d'Herelle published his observations on five patients with bacillary dysentery treated by ingestion of a bacteriophage culture. He did not claim that the specific treatment of dysentery had been discovered but admitted that the facts were convincing to him personally. This treatment, since applied in tens of thousands of cases, has confirmed his belief.

D'Herelle now asserts that bacteriophage therapy should constitute the specific treatment for plague. From 1 to 2 c.c. of a very virulent bacteriophage culture should be injected as soon as possible. Since the treatment is harmless, it can be given as soon as the diagnosis becomes clinically probable, without waiting for bacteriologic verification. A single injection is indicated if the temperature falls steadily; otherwise, a second, or even a third, injection may be given. In the absence of buboes, in septicemic and pnuemonic cases, intravenous injections should be tried."

Bordet (Annales de l'Institut Pasteur, Paris, Sept., 1925) wrote on "The Bacteriophage Question" the summary of his article appearing in J. A. M. A. for Nov. 21, 1925, as follows:

"Bordet argues that the bacteriophage is not a living virus but a lytic substance produced by the bacteria themselves. His present conclusion is based on his five years' study of this transmissible autolysis of bacteria. He regards the autolysis as the result of the elaboratioin of a lytic substance and assumes that this is a normal physiologic function of micro-organisms. The growth of the bacteria proceeds unimpaired as long as the different lytic substances counterbalance each other or are not elaborated in excess. The lysis power and susceptibility to it vary in different bacteria. A bacterium unaffected by its own lytic principle, may be unable to resist the principle elaborated by another species. The receptivity of the bacterium and the local concentration of the lytic principle determine the number and extent of the areas of the transmissible autolysis. It is possible that analogous substances exert an influence on intercellular relations in higher organisms, contributing to normal functioning of organs, or inducing certain pathologic phenomena."

D'Herelle (Comp. Rend., Paris, Nov. 20, 1925) presented arguments to refute Bordet's theory of two potential "lysogenic properties" as an explanation of bacteriophagy. This article was abstracted in J. A. M. A. for Feb. 6, 1926, as follows:

"D'Herelle presents arguments to refute Bordet's recent theory of two potential 'lysogenic properties,' an active or spontaneous and a passive or induced autolysis, as the explanation of bacteriophagy. Bordet's statement was based on the fact that certain bacterial cultures, contaminated by the bacteriophage can be purified, while others cannot. D'Herelle does not believe that there is evidence for such a distinction. He experimented with bacterial cultures which, after having been exposed to the bacteriophage, had lost the lytic property owing to overgrowth of bacteria with acquired resistance. The culture, sown on agar, showed two kinds of colonies; those contaminated by the bacteriophage, and those not contaminated, the ultrapure. After serial transplanting (about ten) the number of the ultrapure colonies gradually decreased, and finally all the colonies were contaminated by the bacteriophage. Bordet's explanation of this phenomenon is that an active lysogenic property at first becomes passive, but reacquires the active property on serial transplanting. D'Herelle accepts this phenomenon as confirming the theory of the bacteriophage as a parasitic ultravirus, affecting bacteria. Under successive transplantations the acute infectious parasitic disease becomes chronic, a comparative balance being established between the virulence of the parasite and the resistance of the bacterium. Bordet and Ciuca ascribe serial bacteriophagy to an 'inherited nutritional defect' caused in the bacterium under the action of leukocyte products. D'Herelle inoculated fresh bacterial cultures with a filtrate containing the bacteriophage. Bacteriolysis developed. The entirely fluid medium was then filtered to exclude all bacteria, or it was heated to a temperature destroying all the bacteria, without killing the bacteriophage. The filtrate thus contained no bacteria that had been in contact with the bacteriophage, but it induced bacteriolysis when inoculated in other normal cultures. The experiment was repeated indefinitely, and always with the same results. It excludes, D'Herellel asserts, a 'hereditary nutritional defect' in the bacteria, since there was no heredity. There were no descendants, so there could be no heredity."

Alessandrini (Policlinico, Rome, Dec. 7, 1925) concluded from his experiments on the action of sodium chloride on the bacteriophage that it behaves like a living cell.

Zdansky (Wien, Arch. f. m., Med., Nov. 1, 1925) used concentrated suspensions of bacteriophages into the washed bladder in cystitis, but only six of twenty patients were cured, and only three of these were treated exclusively with bacteriophage. He thinks the rapid appearance of a bacteriophage resistant strain was one cause of failure.

Dalsace (Jour. d. Urol., Jan., 1926) treated infections of the urinary tract with bacteriophage from colon bacillus in seventeen cases and from staphyloccocci in eleven. From 2 to 3 c.c. of bacteriophage was injected subcutaneously, repeated every second day, never more than four times. During same period from 10 to 20 c.c. were given by mouth, with two or three instillations of from 10 to 20 c.c. into the bladder. Clinical recovery occurred in eight cases. When the lysis test was negative in vitro no effect was obtained.

Larkum (J. Bact., Sept., 1926) found bacteriophage present in 25 per cent of infected urines, and B. coli susceptible to the bacteriophage in the same proportion of specimens. The chronic cases had resistant bacteria and no bacteriophage. The bacteriophage was found in the acute cases. Four patients were treated with definite improvement.

The summaries presented above are taken from abstracts appearing in the Journal A. M. A. Since 1926, the Journal has not seen fit to abstract any of the articles on this subject appearing in foreign journals and since none of the American workers have presented their work until recently, there is a silence of about two years on this subject. Out of all this conflicting material two definite and conflicting ideas have developed. According to d'Herelle the principle which destroys bacteria exists in the form of corpuscles which behave in all respects like true parasites, the corpuscles being ultramicroscopic in size. On the other hand, Besredka and Bordet dispute the parasitic living nature of the bacteriophage and regard it as a chemical substance created by the bacteria. Schultz, of Stanford University, does not think this point is of material importance, although d'Herelle contends that it is fundamental to any proper understanding of the activity of bacteriophages. In his recent book, d'Herelle says: "The fact that bacteriophage is a living being is of prime importance to biology for, aside from indicating the living nature of all ultrafilterable viruses whose nature has likewise been contested, it shows further that being constituted not of a cell in the histological sense of this term, but of simple protoplasmic micella, may be endowed with all the characters of those other living beings; in other words, that the unit of living matter is not the cell, but the micella."

Rice (Jour. Ind. Med. Assn., March, 1928) made a preliminary report and in the same journal for December, 1928, a more detailed report, on 150 cases of staphylococcic and B. co'i infections treated with bacteriophage filtrates. In his preliminary report he referred to some work under way by him, to compare Besredka's antivirus with bacteriophages. They are prepared in the same way, except that no bacteriophage is added to the bacterial culture in making the antivirus. This report of Rice's was published, but was

not available to the writer. In his book, d'Herelle does not mention Besredka nor make any comparison between bacteriophages and the so-called locally immunizing antivirus of Besredka. Rice's report covers boils, carbuncles, cellulitis, osteomyelitis, bed sores and ulcers, suppurating wounds, abscesses, septicemia and acne.

Schultz, of Stanford University, has written two very interesting articles. In Calif. and West. Med., for March, 1927, he gives an excellent summary, discussing the therapeutic applications in bacillary dysentery, typhoid and colon infections, staphylococcic infections, streptococcic infections and bubonic plague. He reiterates the caution, "it is indispensable that the bacteriophage be of maximum virulence for the bacterium upon which it is to act." He dwells at even greater length on this point in his second paper (Calif. & West. Med., July, 1929), emphasizing the two-edged character of the bacteriophage, and outlines the technic of determining the efficiency of the 'phage filtrate for the particular strain of bacteria we are combating. It is far more essential to determine that the 'phage filtrate proposed to be used is positively and highly lytic for the bacteria producing the infection, than it is to determine that diphtheria is present before using diphtheria antitoxin. In the latter event, no particular harm can be done, but a 'phage filtrate which is only weakly lytic for the bacteria present may enhance the virulence of those bacteria, instead of destroying them. The aim is to effect the complete destruction of the bacteria in a given area; if this is not done the infection will return and this time with 'phage organisms.

Rice (Am. Jour. Med. Sci., March, 1930) made a more extended report of his work giving details of 300 cases treated. He concludes that in 90 per cent of the cases they have excellent results by local application of bacteriophage filtrates in staphylococcic and B. coli infections. He found stock filtrates apparently as efficient as specially prepared ones,—provided they are virulent for the bacteria. He had not determined to his own satisfaction to which of five possible methods of operation the results were due: (1) whether the bacteriophage is a direct lytic agent for the bacteria, as claimed by d'Herelle; (2) whether it is an antivirus effect as claimed by Besredka; (3) whether it is the effect of an extremely available antigen in the shape of dissolved bacterial bodies, as suggested by Arnold and Weiss; (4) whether the bacteriophage brought about an avirulent phase in the infecting organisms as the result of microbic dissociation, as suggested by Hadley; (5) whether due to the possible stimulation of tissues by peptone broth, as claimed by Friedlander and Tooney. His series included the following interesting figures: 66 cases of boils and carbuncles with only five failures; 27 abscesses with excellent results in 24; five cases of staphylococcic cellulitis, all successful; staphylococcic purulent arthritis, four cases all cured; 17 appendiceal abscess cases, with excellent results in 14; three cases of peritonitis, two successful; 44 infected wounds, with success in 40; 21 cases of bed sores with excellent results in 15; 35 cases of acne with excellent results in 13, fair results in eight.

Larkum (Am. Jour. P.H., Jan., 1929) summarizes the whole situation very well. He notes that the conditions treated are numerous, but the enteric diseases, infections of the urinary tract and staphylococcic infections in general have received the most attention; that the conflicting results depend apparently on the nationality of the users; and about all that can be gained from the study of the literature is the impression that should the reader be so unfortunate as to contract any one of several diseases, his first request would be for a potent race of bacteriophage.

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## TREASURER'S REPORT

### Arizona State Medical Association

To the Council and House of Delegates, Arizona State Medical Association:

Gentlemen:—

I present herewith Treasurer's report for the year ending April 22, 1931. (Books closed this date.)

### GENERAL STATEMENT

| | | |
|---|---|---|
| **Total receipts all sources:** | | |
| Balance General Fund April 19, 1930 | | $ 1,203.09 |
| Dues 1930, 293 members at $12.50 | | 3,662.50 |
| Donation (Troth) | | 15.00 |
| Refund, State Fair Exhibit, Public Health | | 22.50 |
| Defense Fund, Balance in Savings Bank, April 19, 1930 | $2,603.60 | |
| Interest and coupons | 515.25 | |
| | | 3,118.85 |
| United States Bonds | | 10,000.00 |
| Total Receipts all sources | | $18,021.96 |
| Total Disbursements all sources | | 2,177.90 |
| Total balance all funds | | $15,844.04 |

## ANALYSIS AND STATEMENT BY FUNDS

### 1. GENERAL FUND:

**Receipts**

| | | |
|---|---|---|
| Balance in Bank of Arizona April 19, 1930 | $ 1,203.09 | |
| 293 members pro rated at $6.00 for Defense | 1,758.00 | |
| 293 members prorated at $6.50 General Fund | 1,904.50 | |
| Donation (Troth) | 15.00 | |
| Refund, State Fair Exhibit | 22.50 | |
| Total Receipts | $ 4,903.09 | |

**Disbursements, duly authorized, Paid from General Fund:**

| | | |
|---|---|---|
| St. Louis Button Co., Changing date badges | 6.35 | |
| A. C. Taylor Printing Co., Annual Program | 27.50 | |
| A. C. Taylor Printing Co., Annual Program | 4.50 | |
| D. F. Harbridge, Secretary's Expense | 60.00 | |
| Maricopa County Med. Soc., State meeting | 17.50 | |
| Josephine F. Randolph, Stenog. State meeting | 100.00 | |
| A. C. Taylor Printing Co., Letter heads | 18.50 | |
| Martindell, Horne & Co., Treasurer's bond | 30.00 | |
| Southwestern Medicine, 250 members at $2.00 | 500.00 | |
| Bank of Arizona, Safety Deposit Box | 3.00 | |
| R. J. Stroud, Health Exhibit State Fair | 50.00 | |
| Sloan, Holton, McKesson & Scott, Med. Defense | 311.10 | |
| D. F. Harbridge, Secretary's expense | 60.00 | |
| Sloan, Holton, McKesson & Scott, Med. Defense | 5.00 | |
| A. C. Taylor Printing Co., Annual cards | 3.50 | |
| D. F. Harbridge, Secretary's expense | 60.00 | |
| Sloan, Holton, McKesson & Scott, Med. Defense | 245.86 | |
| Arizona Industrial Congress, Membership dues | 50.00 | |
| Postal Telegraph Co., Telegrams to Washington | 4.44 | |
| Sloan, Holton, McKesson & Scott, Annual Retainer | 100.00 | |
| Sloan, Holton, McKesson & Scott, Basic Sc. Bill | 100.00 | |
| Sloan, Holton, McKesson & Scott, Med. Defense | 276.75 | |
| Drs. Gunter & Kennedy, Work Welfare Committee | 52.00 | |
| Powers & Larson, Stenog. Med. Defense | 49.40 | |
| H. S. McCluskey, Drafting letter to Governor | 25.00 | |
| Sloan, Holton, McKesson & Scott, Med. Defense | 17.50 | |
| April 22, 1931, Transferred to Defense Fund | 961.83 | 3,139.73 |
| April 22, 1931, Balance in Bank of Arizona | | $ 1,763.36 |

### 2. DEFENSE FUND:

**Receipts:**

| | | |
|---|---|---|
| Balance in Savings Bank April 19, 1930 | $ 2,603.60 | |
| Interest June 30, 1931 | 33.29 | |
| Dec. 31, 1930 | 56.96 | |
| Coupons, U. S. Bonds, June, 1930 | 212.56 | |
| Coupons, U. S. Bonds, Dec., 1930 | 212.44 | |
| 293 members prorated at $6.00 Medical Defense | 1,758.00 | |
| Due from General Fund 1930 (Coupons Dec., 1929) | 212.44 | |
| | $5,089.29 | $ 5,089.29 |

**Expenditures:**

| | | |
|---|---|---|
| Bank of Arizona, Safety Deposit Box | 3.00 | |
| Sloan, Holton, McKesson & Scott | 311.10 | |
| Sloan, Holton, McKesson & Scott | 5.00 | |
| Sloan, Holton, McKesson & Scott | 245.86 | |
| Sloan, Holton, McKesson & Scott | 100.00 | |
| Sloan, Holton, McKesson & Scott | 276.75 | |
| Powers & Larson | 49.40 | |
| Sloan, Holton, McKesson & Scott | 17.50 | 1,008.61 |
| Balance in Yavapai County Savings Bank April 22, 1931 | | $ 4,080.68 |

| | | |
|---|---|---|
| CLEARING: Dues 293 members at $6.00 | $ 1,758.00 | |
| Dues from General Fund, (Coupons Dec., 1929) | 212.44 | |
| | $ 1,970.44 | |
| Cost of Medical Defense for year | 1,008.61 | |
| Balance of Defense Fund, in General Fund, Transferred to Yavapai County Savings Bank April 22, 1931. | $ 961.83 | |

| | | |
|---|---|---|
| TOTAL AMOUNT FOR MEDICAL DEFENSE: | | |
| Cash in Defense Funds | $ 4,080.68 | |
| United States Bonds | 10,000.00 | |
| | $14,080.68 | |

| | | |
|---|---|---|
| EARNINGS OF DEFENSE FUND and Bonds since last report: | | |
| Bonds, Coupons June 1930 | $ 212.56 | |
| Bonds, Coupons Dec. 1930 | 212.44 | |
| Savings Account, Interest June | 33.29 | |
| Savings Account, Interest Dec. | 56.96 | |
| | $ 515.25 | |

| | | |
|---|---|---|
| UNPAID EXPENSES FOR 1931: | | |
| To Southwestern Medicine— 293 members at $2.00 | $ 586.00 | |
| To Secretary for office expense | 120.00 | |
| Stenographer annual meeting | 100.00 | |

RECOMMENDATIONS:

1. In 1929-30 our total receipts for Medical Defense were only $272.37 more than our expenses. This year they are $1,264.74 more than our expenses. However, the lesson for 1931 is that we should continue our Medical Defense dues as last year, $6.00. The Association dues of $6.50 gave us a small balance. The total dues should be the same as last year, $12.50.

2. Our bonds, $10,000, are First Liberty Loan Converted bearing 4¼% interest, and may be called before the next annual meeting of our Association. I would suggest that the Council discuss this matter at this time.

Respectfully submitted,
C. E. YOUNT,
Treasurer.

We, the undersigned, a committee duly appointed by President James M. Greer, have audited the books of the Treasurer and inspected the bonds in his custody, and find them to be correct.

H. T. SOUTHWORTH.
J. H. ALLEN.

## MARICOPA COUNTY MEDICAL SOCIETY INCORPORATES AND ADOPTS REVISED CONSTITUTION

Pursuant to action taken early in the year, Articles of Incorporation have been issued to the Maricopa County Medical Society (Arizona), and at the regular meeting of May 11, 1931, these Articles of Incorporation were adopted as the Constitution of the Society, and the revised By-Laws were adopted. The new Constitution and By-Laws are given below:

### ARTICLES OF INCORPORATION of the MARICOPA COUNTY MEDICAL SOCIETY

KNOW ALL MEN BY THESE PRESENTS: That we, the undersigned, whose residence and post-office addresses are set opposite our respective names, under and by virtue of the provisions of Chapter XIV of the Revised Code of Arizona, 1928, and particularly under the provisions of Sections 602-611 inclusive thereof, having this day associated ourselves together for the purpose of forming a non-profit corporation, do hereby adopt the following Articles of Incorporation.

ARTICLE I.

The name of the corporation shall be
MARICOPA COUNTY MEDICAL SOCIETY
and its principal place of business shall be in the City of Phoenix, Arizona.

ARTICLE II.

This corporation shall have no capital stock and shall be a non-profit corporation as contemplated by the provisions of Section 602, Revised Code of Arizona, 1928. This corporation is formed for scientific research in all branches of science connected with the practice of medicne.

ARTICLE III.

Membership in this corporation shall be personal and not transferable. Each member shall be entitled to one vote to be cast by the member personally. Members shall be admitted, classified, continued in good standing, suspended or expelled in accordance with such reasonable rules and regulations as the corporation may adopt from time to time. A member may resign at any time by giving notice thereof in writing to the corporation or its secretary.

ARTICLE IV.

The purposes of the Society shall be:

(1) To promote the science and art of medicine;

(2) To develop a high type of ethical practice among its members;

(3) To conserve and promote the public health;

(4) To secure unity and harmony in the profession so as to make effective its opinions in all scientific, legislative, public health, material and social affairs, to the end that the profession may receive the respect and support from the community to which its honorable history and great achievements entitle it;

(5) For the better attainment of these objects, the Society aims to bring into one organization all reputable, ethical and competent physicians, possessing the qualifications herein specified, of Maricopa County, and to unite with other County Societies to form the Arizona State Medical Association, and through it with other State Associations to form and maintain the American Medical Association.

ARTICLE V.

Section 1. Every legally licensed practitioner of medicine or surgery in the county of Maricopa, State of Arizona who is of good moral and ethical standing, and who does not support or claim to practice sectarian medicine, who is a graduate of a reputable medical college, which at the time of his graduation maintained the standards equivalent to those of the Association of American Medical Colieges, shall be eligiible to membership, provided that the Society as a whole as represented by its membership in attendance at its regular meetings shall be the sole judge of the qualifications for membership of its members or applicants for membership, and that the vote of the membership of the Society at such meetings shall be conclusive upon the question of the right to membership.

Section 2. An applicant for membership, unless his application is accompanied by a transfer card issued by other component county or district societies, must, in addition to the above requirements, be a resident of the county of Maricopa, State of Arizona, and must have been such resident and actively engaged in the practice of medicine for a period of at least six months before he shall be eligible to membership.

Section 3. Applicants for membership possessing the qualifications enumerated in Section 1 of this Article and who present properly attested transfer cards within sixty days after the issuance of said card from other county medical units or the American Medical Association in the United States, may present their cards at any time after their location in Maricopa county, Arizona, no period of prior residence being required of such applicant for transfer, provided that such physician shall have otherwise complied with all the laws of the State of Arizona regarding medical practice, and the Articles of Incorporation of this Medical Society, and provided further, that this Society shall have the same exclusive right to pass upon such qualifications of such applicant as is provided in Section 1 of this Article.

ARTICLE VI.

Neither the members of this Society nor their private property shall be liable in any manner for any corporate debts, obligations, undertakings or for any damages incident to or arising out of any

(Continued on page 234)

# Southwestern Medicine

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## MALPRACTICE SUITS IN ARIZONA

A year ago, there were pending in the Courts of Arizona against members of the Association the following cases:

James Mammon vs. Drs. C. H. Laugharn, W. R. Quinn and E. J. Gungle, in the Superior Court of Greenlee County;

Jack Flanigan vs. Drs. A. C. Rounseville and P. A. Melick, in the Superior Court of Coconino County.

The case of Mammon vs. Dr. Laugharn et al. was tried beginning on December 20, 1930. The action was brought for damages in behalf of the parents for the wrongful death of a deceased boy child twelve years old. The complaint charged that the operation for appendicitis of the deceased child was performed without the consent of the parents and was the cause of death. It charged various acts of negligence on the part of the physicians, among them being that the surgical instruments and hands of the defendants were not properly sterilized; that no proper examination was made; that the operation was unnecessary, and other equally absurd claims. Th plaintiff called both Dr. Laugharn and Dr. Gungle to the stand as witnesses on cross-examination under the statute. It appeared from such examinations that the child had a severe case of appendicitis when Dr. Laugharn was first called; that an immediate operation was advised but that both the mother and father refused to permit it; that twenty-four hours elapsed and the case became much more acute and the condition advanced; that at that time Dr. Laugharn was called on the 'phone and told in substance that the operation might be performed; that the child was taken to the hospital and the operation performed; that pathological tests showed a streptococcic infection of the appendix; that the appendix was ruptured and the infection had spread to the abdominal cavity. The evidence also showed that not only did both the parents consent to the operation, but that the mother accompanied the child to the hospital and was present at the hospital at all times during the operation, but not in the operating room; that the child died in about forty-eight hours after the operation was performed; that had it been performed twenty-four hours earlier it probably would have been successful; that the infection had so far developed that it and not the operation was the cause of death. Upon the completion of the examination of the two doctors, it was clear that the plaintiff had no case and the plaintiff's attorney immediately moved for non-suit. As the statute of limitations has run against the bringing of a new action, the case is concluded by such non-suit.

In the case of Flanigan vs. Drs. Rounseville and Melick it was alleged that the defendant physicians in making a series of x-ray pictures had seared plaintiff externally and internally. That said burning had seared, injured and paralyzed plaintiff's bowels and liver area; that plaintiff as a result of such burns had suffered for a long period of time great pain. The complaint alleged without going into detail that the burns were caused by the careless and negligent operation of the x-ray apparatus. This case had been pending for a long period of time. Apparently plaintiff was unable to obtain any medical testimony in support

of his claim of carelessness and negligence on the part of the physicians. Somewhat less than a year ago, the case was dismissed with prejudice as against both physicians, without it having been tried.

Four cases have been filed during the past year against members of the Association and have come under the attention of the writer.

The first was the case of Charles A. Angle vs. Drs. E. D. Berends and R. C. Lieuallen. The complaint in this case charged that the two defendants were employed during the confinement of Mary L. Angle, deceased, to render such services as were proper and necessary during confinement and childbirth. The acts of negligence charged were that the defendants failed to discover the presence of a second unborn child and the attendant placenta. The complaint alleged that upon the arrival of Dr. Berends, one of the defendants, at the time of the delivery, there had been born one child which had been born dead, and that another child remained in the person of the deceased. The complaint further alleged that a few days thereafter and on June 23, 1929, Mary L. Angle died. That the cause of her death was the negligence of the defendants in failing to discover the presence of the unborn child and the attendant placenta. The case came to trial on January 31st of this year. In fairness to the defendants it must be said that on the trial there was an absolute want of anything approaching competent testimony as to the facts alleged in the complaint. The plaintiff accompanied by three witnesses, had had the body exhumed some fourteen months after the burial and an examination made. An attempt was made to elicit the testimony of three witnesses, none of whom were medical men or could qualify in any way as experts. No representative of the defendants was present at such exhumation; however, no witness that was present at the time had the temerity to testify that any evidence was discovered of any unborn child. Dr. Berends, one of the defendants, was placed on the witness stand on cross-examination by the plaintiff. He testified that he had been called to Mrs. Angle some twenty days prior to the confinement. That upon his first visit he discovered that she was suffering with diabetes in a very advanced stage. That he administered insulin and put her upon a strict diet but that the case was so far advanced that she did not respond to the treatment. That at the time of the confinement the patient was in a comatose condition; that the child had been delivered and showed evidence of having been dead for some days.

No doctor appeared on behalf of the plaintiff to testify against the defendants. John W. Ray, attorney for the plaintiff, made the statement to the Court that he had had a physician who had agreed to testify; that such physician on the evening prior to the trial notified him or the plaintiff that he would not testify for the reason that some Board, Body or person had notified him that if he did appear and testify against the defendants that his license to practice medicine would be revoked. This absurd and ridiculous statement on the part of the attorney for the plaintiff was thoroughly investigated. An ex parte hearing was had. The physician mentioned was brought into Court but he very promptly said that no such threats by any Board, Body or person had been made. The Court then announced that he would be compelled to grant our motion for a directed verdict upon the ground that there was no competent testimony of any character to show that the defendants or either of them were guilty of any act or omission of malpractice, or that the death of the deceased was caused by any act on the part of the defendants or either of them. Upon this announcement by the Court, the attorney for the plaintiff moved for a dismissal of the cause without prejudice to the bringing of another case; however, no case has been brought against the defendants or either of them in this jurisdiction. Dr. Lieuallen has left the state. We do not believe any further case will be brought.

The case of August Pavell vs. Dr. W. O. Sweek was filed July 14, 1930. This action is based upon an operation for appendicitis performed on the 7th day of June, 1928. It is alleged in the complaint that the defendant carelessly and negligently and in violation of the established medical practice inserted a surgical needle in the body of the plaintiff and failed to remove the same. It has been established by x-ray photographs that there is a surgical needle in the body of the plaintiff. The defendant, however, did not knowingly insert the same in the body. He has no knowledge whatever of how it came there.

The law relating to the responsibility of the physician in undertaking an operation and for removal of all objects has undergone a distinct change during the last few years. Formerly it was held that in performing an operation it was the duty of a surgeon to exercise reasonable care and skill; that the operation begins when the incision is made and ends when the opening has been closed

in the proper way after all the appliances necessary to a successful operation have been removed from the body, and that throughout the operation the law imposes on the surgeon the duty of exercising such care and skill; and that the removal of the sponges and pads is a part of the operation, and an operation cannot be said to be concluded until such removal takes place; that the surgeon cannot relieve himself from liability for injury to a patient by leaving a sponge in the wound after the operation by any custom or rule requiring the attendant to count the sponges used and removed, accompanied by the statement of the nurse that the sponges were all properly accounted for and his reliance on such statement. There are many of the older cases which adhere to the foregoing rule. Almost without exception, however, the modern cases hold that where the evidence is uncontradicted and clear and comes from competent and qualified witnesses that the surgeon adopted methods recognized as standard and approved as precautions to avoid the leaving of objects within the body, the plaintiff cannot recover. In other words where it is shown that it is the custom in the community that a nurse designated for that purpose who is not the employee of the physician assumes the responsibility for counting all surgical instruments, appliances and materials used in the operation and it is further shown that in the operation in question that custom was followed, no responsibility attaches to the physician unless it is shown by direct and positive evidence that he was guilty of some negligent act or omission in connection with the matter.

In the case of Pearl G. Champie vs. Dr. Alexander M. Tuthill the complaint alleges that on October 16, 1928, plaintiff in an automobile accident fractured her right leg a few inches above the knee; that the fracture was set by a physician and was in the process of knitting and healing when on November 22d of that year the defendant was employed to make an examination of the leg and of her physical condition. That on the 24th of November the defendant, without plaintiff's consent, caused plaintiff to be removed to the operating room and placed under an anesthetic, and in disregard of plaintiff's physical condition did rebreak or cause to be rebroken the leg of plaintiff at the place of the original fracture and reset the leg. It is alleged in the complaint that due to the rebreaking the leg became infected and an amputation became necessary and was performed. Damages were sought in the sum of $25,000.00. This would appear to be a case absolutely devoid of merit as the defendant never acted in any other capacity than as a consultant.

The last case to be brought was that of George Carlson vs. E. L. Hicks. This action seeks damages in the sum of $5,000.00 and alleges want of skill in connection with the treatment of a broken arm on the 28th day of December, 1930. The complaint was wholly devoid of any proper allegations showing any violation of good practice on the part of the defendant. A motion to have the complaint made more definite and certain in that regard was granted by the Court and ten days given to amend. No amendment was filed within the time and motion to dismiss has been made for failure to make such amendment within the time. It would appear that the plaintiff or his counsel are unable to point to any negligence whatever.

It gives me pleasure to reiterate what I have heretofore reported that so far as I know there has never been a malpractice case won in the courts of this state. Certainly none of those brought against members of the Association have been successful.

C. R. HOLTON.

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## THE ETHICS OF ADVERTISING

We frequently speak of advertising by doctors as if such a method of approaching the public were always unethical. However, advertising by doctors **can** be done ethically. Before we proceed to any intelligent discussion of this subject, we need to define clearly what we mean by advertising and what we mean by ethics as applied to such advertising. The Code of Ethics of the American Medical Association was formulated for the individual doctor, so we may greatly limit our discussion by confining it to personal advertising of a physician, or group of physicians.

By "advertising" in this sense we mean a public notice, prepared by or approved by, a doctor or group of doctors, designed to give personal information regarding the doctor or group, or their activities. Thus defined, advertising has three phases: (1) It must be public, which does not mean that it must be printed because it may be by word of mouth or over the radio. (2) It must be prepared by, or approved by, the people interested; this takes out of consideration news items secured by reporters and printed on their own initiative. For example, if a reporter learns that a medical

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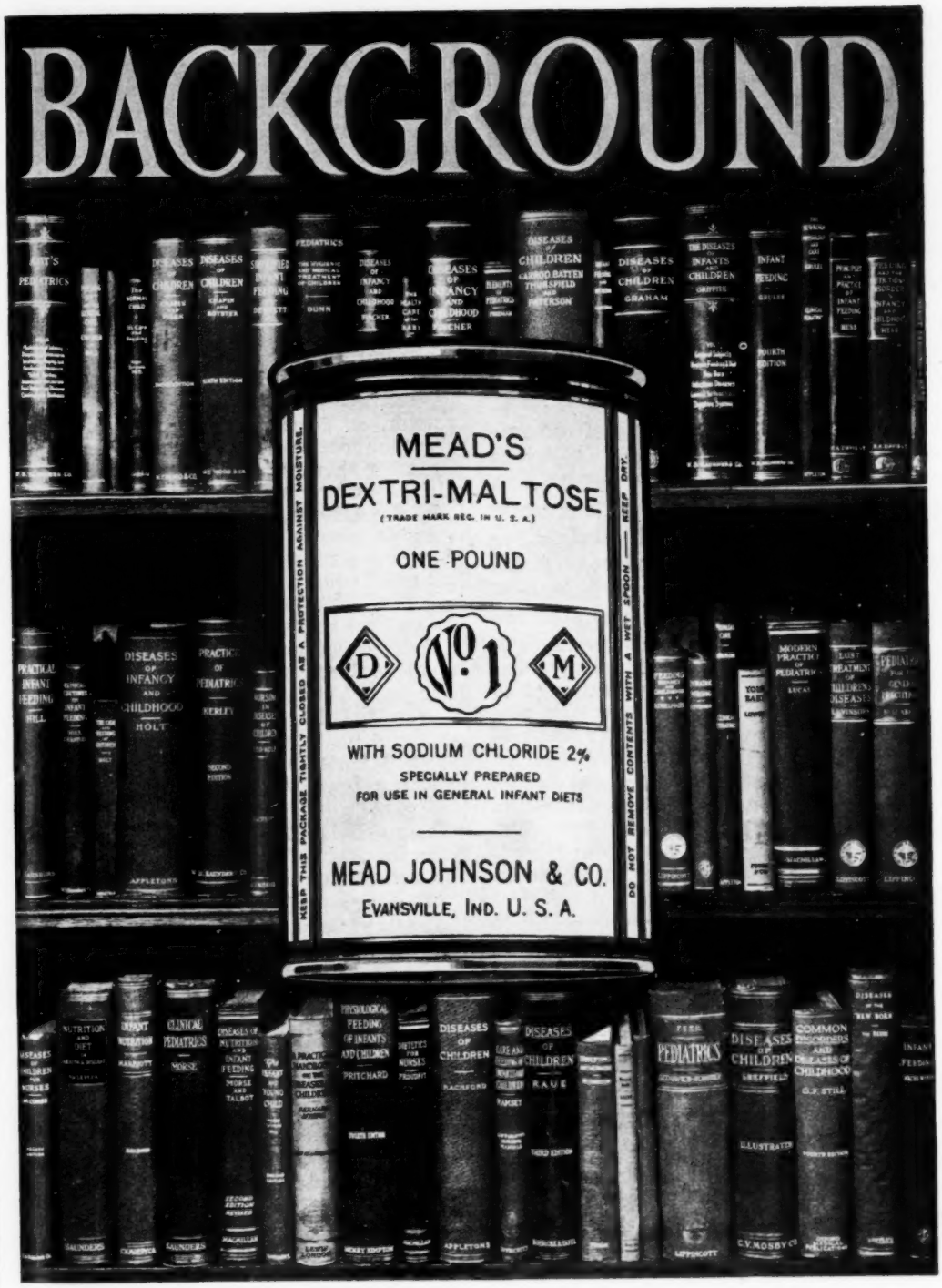
In specifying "Lilly" you are designating products made from the finest of carefully selected and tested crude materials by the most approved manufacturing processes and packaged under safeguards that assure you and your patients just what you ordered.

society meeting has been held and that Dr. W. has read a paper, and publishes this fact, that is not advertising, because it was done without the knowledge of the doctor mentioned in the news item; however, if Dr. W. goes to the newspaper and asks them to publish the same facts (and be sure to spell his name right), that will be personal advertising, and it may be entirely ethical advertising. (3) It must give information about the doctor or doctors or their activities. We can print a whole page in the newspaper, telling about the advantages of immunizing against diphtheria, and so long as we do not mention individuals, it is not personal advertising. But if, with Dr. X's consent, we should state that he, as school physician, will have direction of this work, it would be classed as personal advertising, as here defined, and it might be entirely ethical. In other words, a doctor may deliberately publish in newspapers or elsewhere, information regarding himself, and keep the presentation and data so advertised entirely within ethical limits.

This brings us to the definition of ethics as applied to personal medical advertising. The ethical limits of advertising by a doctor, or group of doctors, are perhaps more definitely prescribed than any other action or activity a doctor may engage in. These limits are clearly and specifically stated in the Code of Ethics of the American Medical Association, which this society in its constitution says shall govern the professional conduct of our members. Personal advertising, to remain ethical, must be kept within the bounds of a triangular limit, the equilateral sides of which can be drawn as follows (1): It must be **true.** The description of the activities of a physician or group must not, of course, transcend the bounds of truth, for it goes without saying that it is unethical for a doctor to make false claims about himself. (2) It must **not be self laudatory.** Public expressions must be confined to that somewhat vague field of good taste and courtesy which forbids self praise or the claiming of superiority over other physicians in the community, even when such claims may be true. In the days when John B. Murphy visited Phoenix, he would come quietly and courteously into the offices of local doctors, to consult with patients and advise the local surgeons about treatment. Never did he claim, nor permit to be published in local papers, that he could reconstruct a joint better than any local doctor. That was ethical conduct because it was common courtesy. Had there appeared, with his knowledge and consent, any newspaper item to the effect that "Dr. John B. Murphy, the leading surgeon of America, is now in Phoenix prepared to give service which no local doctor can give," that would have been unethical advertising, even though every word of it would, without question, have been true. (3) The third limiting border of the triangle of ethics in personal advertising is that it must not reflect upon, nor **do injury to,** the reputation or standing of other physicians of the community. Medical ethics forbids, in unequivocal terms, the claiming by any physician or group that they can render service superior to that obtainable elsewhere in the community.

Physicians, then, may ethically send out cards of announcement, giving their location, office hours, telephone numbers, specialties practiced, changes in location, new associations formed, or other information which will enable patients to find them or communicate with them. They may not ethically solicit patients, directly or indirectly, through the mail, through agents, through the newspapers, over the radio, or in any other manner. They cannot ethically sanction newspaper articles of a laudatory nature, which directly or indirectly are intended to lead the public into the belief that such physicians possess superior ability or can render superior service.

It is very desirable to understand what we shall regard as ethical and what as unethical in newspaper articles, radio talks, or public communications of any sort. We have had too much desultory talk about this without a defined policy. It is stated in most county medical society constitutions that their members are bound by the Code of Ethics of the American Medical Association; that violation of the Code of Ethics constitutes unprofessional conduct; that members guilty of unprofessional conduct are subject to discipline, varying all the way from censure to expulsion from membership. If there is misunderstanding about this, we would suggest that every medical society adopt a definite and unmistakable policy for future guidance. It is further suggested that this policy be to the effect that no doctor or group of doctors shall advertise to the public, in any manner whatsoever, a claim to give a service superior to that obtainable elsewhere in the community, or to advertise to render services for charges below those obtainable elsewhere in the community, or to seek to obtain patients by solicitation of any kind, other than the dignified and courteous announcements recognized by ethical requirements.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## ARIZONA'S FORTIETH IN NOGALES

The Fortieth Annual Meeting of the Arizona State Medical Association, which was held in Nogales, Ariz., May 6, 7 and 8, was a very successful one. The scientific program was a well balanced one, with excellent papers and very creditable attendance. A full report of it will appear in an early issue of this journal. The social features of the meeting were very enjoyable, showing evidence of careful planning, excellent judgment in details, and skillful management so as not to interfere with the scientfiic programs. There was a good attendance of ladies.

Dr. Clarence Gunter, of Globe, was elected president, a fitting recognition of his fine work on the Public Welfare Committee. The next annual meeting will be held in Miami, Ariz., the Gila County Medical Society to be the hosts.

## THE MAYTAG RESEARCH LABORATORY FOR TUBERCULOSIS

We have received the Bulletin announcing the dedication of the Maytag Research Laboratory for Tuberculosis, which has been built in Albuquerque and which will be operated in conjunction with the Southwestern Presbyterian Sanatorium and the University of New Mexico. The laboratory is the gift of Mr. F. L. Maytag, of the Maytag Washing Machine Company and represents a donation of $150,000. The laboratory is a very substantial structure, completely modern and thorough in every detail. It has three large laboratories, a central library, and provision has been made for expansion as the work of the Laboratory progresses. The Director of the laboratory has not yet been selected. This is a notable addition to the scientific institutions of the west.

## CHIROPRACTIC: WHY IT FLOURISHES IN ARIZONA AND FAILS IN DELAWARE

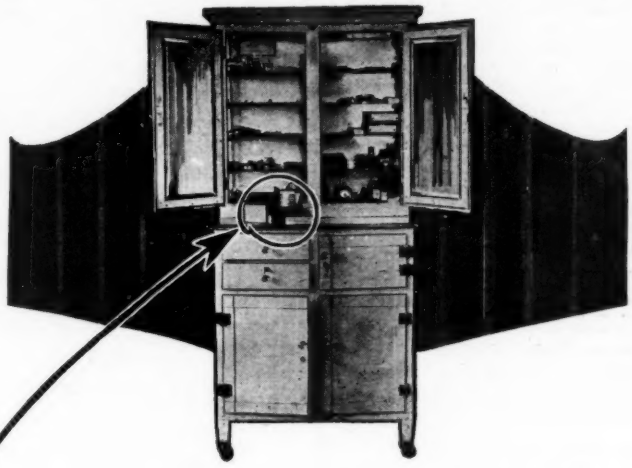
That species of quackery known as "chiropractic" flourishes like a green bay tree in Arizona. The reason for that is the lack of fundamental information among the people of the state and the failure to exercise any great measure of intelligence on the part of legislators. Several years ago the chiropractors succeeded in fooling the legislature into creating a separate licensing board for them, so that they could examine themselves and license themselves. In the hearing on that bill, the representatives of the medical profession agreed that the chiropractors might do whatever they pleased, so long as they might be forbidden to use the name "Doctor," or to hold themselves out, in any manner, as directly or remotely connected with the practice of medicine. In some manner, after this was agreed upon in the committee, the provision was dropped from the bill. In Arizona, today, it requires a well educated person to distinguish from the newspapers reference between "Dr. So-and-So" who is not a doctor but a chiropractor, and "Dr. X" who is a bona fide member of the medical profession. A recent news item in the Arizona Republic, of Phoenix, referred to an accident to a chiropractor with the heading "Physician Injured." It is that type of education by news articles which trains people into an inability to distinguish between an honorable profession and a brand of quackery from which the public should be protected.

As to Delaware, we quote an editorial from the A. M. A. Journal of April 4, 1931. The comparison will be obvious:

"Governor Buck of Delaware has returned to the legislature, without his approval, a bill to create a board of chiropractic examiners and to regulate the practice of chiropractic. His summarization of the reason for his veto is so clear and terse that it should be read by the legislators and governors of every state that is threatened or already afflicted with this cult. His statement follows:

> The purpose of the act, as I understand it, is to legalize the practice of chiropractic in this state. Practitioners of this cult are not recognized now. Do they profess to be doctors in the same sense of the term as is commonly understood to apply to men and women of the medical profession? Insofar as I am able to determine, there is not a recognized medical school in the country that includes in its curriculum a course in chiropractic. This fact in itself seems singularly significant.
>
> Even to the lay mind the idea that all disease of whatever character is due to spinal displacements of a mild sort, and that cures of such ailments as tuberculosis, smallpox, diphtheria, scarlet fever and others can be effected by manipulation and fingering of the spine is preposterous.

# ANTIRABIC VACCINE



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Before returning this bill to you I have satisfied myself that the training and education a chiropractor, or drugless healer, needs to practice his art does not fit him properly to advisedly treat the sick, inasmuch as he is not qualified to diagnose ailments nor recognize communicable diseases and to take measures to control them. He is therefore an opponent to the department of health.

Wherefore, it seems to me it would be inconsistent for the legislature to appropriate, as it will do, money for the state board of health, which board is trying to eradicate communicable diseases, and at the same time legalize the practice of a cult which does not believe in the germ theory of a disease but does teach and believe that such diseases as scarlet fever, etc., are due to a distracted vertebra and the method to prevent and cure such disease is to see that everybody has a normal spine."

## THE MEDICAL ASSOCIATION DE LA LAGUNA

**Torreon, Coah., Mexico, Sept. 13, 14 and 15.**

Announcement has been received of the second annual meeting of the Medical Association de la Laguna, which is the northern branch of the Medical and Surgical Association of the Republic of Mexico. This meeting will be held at Torreon, state of Coahuila, and the Association, through its President, Dr. Salvador De Lara, wishes to issue through this journal an invitation to the medical men of the Southwest a cordial invitation to attend this meeting. His invitation reads as follows:

"To The Medical and Surgical Association of the Southwest:

"The Medical Association de la Laguna, a branch of the Medical and Surgical Association of the Re public, will celebrate in this city of Torreon during the 13th, 14th and 15th days of September next the Second Medical Convention of the North and we have the honor of extending our most cordial invitation to your Association to take an active part in our Convention.

"We appreciate that this is a brilliant opportunity to have a better understanding between the doctors of the Southwest of the United States and the Northwest Mexican doctors, in which case we beg of you to accept our invitation.

"Please be kind enough as to indicate how many delegates will come and the kind of work which each one of them will present (General Medicine, General Surgery, Gastro-Enterology, Gynecology and Pediatrics) to make them figure in our program."

## AMERICAN MEDICAL GOLFING ASSOCIATION TOURNAMENT

**Philadelphia, June 8, 1931.**

The Seventeenth Annual Tournament of the American Medical Golfing Association will be held in Philadelphia, Monday, June 8th, at the Aronimink Golf Club instead of the Huntingdon Valley Country Club, as announced in the Brochure of the Association which was recently mailed to members. The Aronimink Colf Club is modern, the course is in splendid condition and is interesting and sporty. The Local Committee is doing everything possible to make the tournament a great success. The Philadelphia men composing the Local Committee on Arrangements are Dr. John W. Croskey, Chairman; Dr. Willis F. Manges, Dr. Fred H. Leavitt, Dr. Frank J. Kelly, and Dr. Damon B. Pfeiffer.

Membership in the American Medical Golfing Association is open to any male Fellow of the American Medical Asscoiation in good standing. It is hoped that many of the medical golfers throughout this State will join the Association this year and take part in the Philadelphia tournament. There will be many attractive and valuable prizes awarded at the Annual Dinner, to be held on the evening of the day of the tournament at the Club House. For any additional information, communicate with any member of the Local Committee, or with the Executive Office, 1124 Maccabees Bldg., Detroit, Michigan.

## MARICOPA COUNTY MEDICAL SOCIETY INCORPORATES AND ADOPTS REVISED CONSTITUTION

(Continued from page 225)

of the corporate actions or conduct of the corporation's affairs.

ARTICLE VII.

Any physician who desires to become a member of the Society must make application in writing on a regular blank form provided by the Society for that purpose. The application must be accompanied by the annual dues and must be endorsed and approved by two members of the Society. Such application shall have printed thereon as a part of said application, Articles V and VI of these Articles of Incorporation, and immediately above the signature of the applicant there shall be printed in legible type thereon the following words:

> "The undersigned has read this application and submits the same subject to the provisions of the Articles of Incorporation of the Maricopa County Medical Society, and particularly Articles V and VI thereof, a copy of which is included in and made a part of this application, and hereby agrees in case of his election that his membership in the Maricopa County Medical Society shall be in strict compliance with all the By-Laws, rules and regulations thereof."

Such application shall be referred to the Board of Censors of the Society and the members of such Board shall make such investigations and reports as they deem necessary and proper for the welfare of the Society, and they shall cause written notification of such application, and the time of the election to be held thereon, to be sent to each member of the Society at his last known address, such notices to be sent by U. S. mail at least ten days before the date of such meeting. It shall require a two-thirds vote to admit the applicant. The vote shall be by secret ballot.

ARTICLE VIII

The Maricopa County Medical Society shall adopt By-Laws for its government, which By-Laws may be amended in the following manner: By giving written notice to each member of the Society of the nature of the proposed amendment at least ten days in advance of the meeting of the Society to which the question of such amendment shall be submitted. It shall require a two-thirds vote of the members of the Society attending such meeting to effectuate such amendment.

ARTICLE IX.

The fees of admission and for annual dues shall

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## for
## PHYSICIANS... SURGEONS... HOSPITALS

The progress of Science in our modern day, is amazingly rapid . . . and the physician, surgeon, nurse, and hospital best able to cope with the problems of treatment and operation, are those who co-ordinate their own skill and experience with efficient up-to-the-minute professional equipment . . . surgical supplies and X-Ray apparatus, such as are produced by the World's finest makers and distributed by reliable supply houses such as R. L. Scherer Co.

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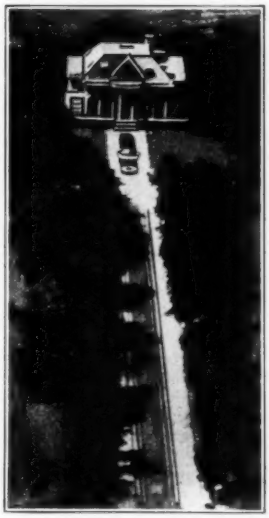
# THE ROBINSON CLINIC

The value of the special school for problem children has been proven; both the individual and the group profit by this system. There are many children attending the regular schools, who should not be sent there. This group may be divided into four classes—the feebleminded, the organic cases, the problem child and the psychotic.

These children realize they are different from other children, and suffer from inferiority feelings. They attempt to satisfy the lowered ego by attracting attention to themselves, by any possible means. Because of these actions, they become exaggerated school problems—even minor criminals. The only solution to their problems is to send them to schools where they are not exposed to cruel childish taunts, the other children being like themselves, and so do not develop feelings of inferiority.

The Robinson School was founded with this need in view and offers ideal conditions. The school gives a full curricula, with an expert teacher, constant medical and nursing care, and is located on the outskirts of the city, where sunshine and fresh air are constant aids in physical rehabilitation. The rates are reasonable.



CURTIS-WRIGHT FLYING SERVICE

Nervous and Mental Diseases
G. Wilse Robinson, Jr., M.D.
Associate Medical Director

G. WILSE ROBINSON, M.D.
Medical Director
1432 Professional Building
8100 INDEPENDENCE ROAD
KANSAS CITY, MO.

Drug and Alcohol Addiction
Paul A. Johnson, M.D.
Internist

be fixed by the By-Laws of the Society and shall be paid into the Treasury of the Society.

ARTICLE X.

The canons of ethics adopted by the American Medical Association are hereby adopted by this Society as the standard of ethical conduct of its members. Violation of such canons of ethics shall be ground for expulsion of any member of the Society but such grounds shall not be exclusive. The Society may in its By-Laws provide for other grounds of expulsion.

ARTICLE XI.

The existence of this corporation shall begin at the time of the issuance of its certificate by the Arizona Corporation Commission, and shall extend for a period of twenty-five years thereafter, provided that the same may be extended beyond such period in the manner provided by law.

ARTICLE XII.

The corporation at no time may subject itself to any indebtedness or liability direct or contingent.

ARTICLE XIII.

The affairs of the Society shall be conducted by a Board of not less than three nor more than twenty-five Directors, who shall be elected by the members of the Society in the manner prescribed by its By-Laws, provided that the Society may elect such other officers and executives as may be prescribed by its By-Laws.

ARTICLE XIV.

It is recognized by these Articles that the corporation formed hereby is the incorporation of an unincorporated body heretofore known as the Maricopa County Medical Society, and every member in good standing in the Maricopa County Medical Society at the time of the incorporation hereof, shall, ipso facto, be entitled to a membership in this corporation without the making of application therefor as prescribed herein for new members.

The officers of the Maricopa County Medical Society as it heretofore existed shall continue as the officers of the corporation until the annual election of officers shall occur as provided by the By-Laws of the corporation.

ARTICLE XV.

The names, residences and postoffice addresses of the incorporators are as follows:

W. Warner Watkins, Goodrich Building, Phoenix,, Arizona.

J. M. Greer, Security Building, Phoenix, Arizona.

Victor Randolph, Goodrich Building, Phoenix, Arizona.

That an election as provided by Section 602 of the Revised Code of Arizona, 1928, was held for the purpose of electing Directors on the 9th day of March, 1931, and at said election the incorporators above named were duly and regularly elected as Directors and incorporators.

## BY-LAWS

CHAPTER I.—OFFICERS.

The officers of this Society shall consist of a President, a Vice-President, a Secretary-Treasurer, Delegates, Board of Censors and Board of Directors. These officers shall be elected at the annual meeting to serve for one year, except as noted below. Delegates shall be elected in accordance with the constitution and by-laws of the Arizona State Medical Association. The Board of Censors shall consist of three members, one member to be elected each year to serve for three years. The Board of Directors shall consist of nine members, the president, vice-president and secretary-treasurer being three members; the remaining six shall be elected in the following manner: At the first regular meeting following the adoption of these by-laws two directors shall be elected to serve the remainder of the current year; two to serve the remainder of this year and one additional year, and two to serve the remainder of this year and two additional years; at the next annual meeting and at each annual meeting thereafter two directors shall be elected to serve for three years.

Section 2. The officers of the Society and corporation shall be elected at the last meeting in December of each year, which shall be known as the annual meeting. A nominating committee of three shall be appointed by the president to present nominees for all the offices to be filled; they will report at the annual meeting, following which opportunity shall be given for nominations from the floor. Elections shall be by ballot and a majority of the votes cast shall be necessary for election.

Section 3. The President shall preside at meetings of the Society, and perform such other duties as custom and parliamentary usage may require. He shall serve as chairman of the Board of Directors of the corporation. He shall be the real head of the profession in the county during the year, and it shall be his pride and ambition to leave it in better condition as regards both scientific attainments and harmony than at the beginning of his term of office.

Section 4. The Vice-President shall assist the President in the performance of his duties, shall preside in his absence, and in the event of the death, resignation or removal from the county of the President, shall succeed to the presidency. He shall serve as member of the Board of Directors of the corporation, and shall be vice-chairman of said Board.

Section 5. The Secretary shall record the minutes of the meetings and receive and care for all records and papers belonging to the Society, including its charter. He shall notify each member of the Society as to the time and place of each meeting, and, whenever possible, give the program for the meeting. He shall receive and hold subject to the order of the Board of Directors, all the funds of the Society, paying out the same only on the order of the Board of Directors, signed by the chairman of the Board. He shall make and keep a list of the members of this Society in good standing, noting of each his correct name, address, place and date of graduation, and the date of the certificate entitling him to practice medicine in this state; and in a separate list he shall note the same facts in regard to each legally qualified physician in this county not a member of this Society. It shall be his duty to send a copy of such lists, on blank forms furnished him for that purpose, to the Secretary of the state association at such time as may be designated by the state association. In making such lists he shall endeavor to account for each physician who has moved into or out of the county during the year, stating, when possible, both his present and past address. At the same time, and with his report of such lists of members and physicians, he shall transmit to the state association remittance for the annual dues of the Society.

Section 6. The Delegates shall attend and faithfully represent the members of this Society and the profession of this county in the House of Delegates of the state association, and shall make a report of the proceedings of that body to this Society at the earliest opportunity.

Section 7. Board of Censors. This Board shall examine and report on the qualification of appli-

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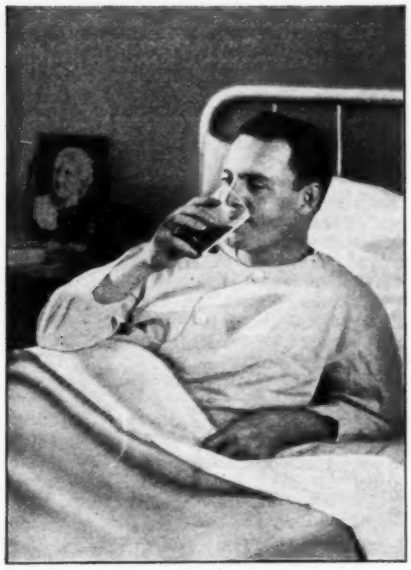

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cants for membership, subjecting each applicant to such examination as it may deem necessary. It shall investigate charges preferred against a member, and report its conclusions and recommendations to the Society. In case of the absence of a member of the Board, the President may appoint some member to fill the vacancy. The senior member of the Board in point of service shall be Chairman of the Board.

Section 8. Board of Directors. The Board of Directors of the corporation shall include the President, Vice-President and Secretary-Treasurer of the Society who shall be, respectively, chairman, vice-chairman and secretary-treasurer of the Board of Directors of the corporation, together with six directors elected by the members of the corporation as set forth in Section 1 of this chapter. The duties of the Board of Directors shall be to administer the financial and business affairs of the organization, and all matters concerned with the expenditure of the funds of the society, or concerned with the business affairs of the corporation or society shall be referred to them. They shall be responsible to the Society for their actions and shall make reports to the incorporated body whenever requested by said body to do so.

## CHAPTER II.—COMMITTEES.

Section 1. There shall be a standing Committee on Program and Scientific Work, and a Committee on Public Welfare, and such special committees as may from time to time be deemed necessary.

Section 2. The Committee on Program and Scientific Work shall consist of the President, Vice-President, Secretary-Treasurer and such other members as the President may appoint. It shall be its duty to promote the scientific and social functions of the Society by arranging attractive programs for each meeting and by urging each member to take part in the scientific work. It shall stimulate fraternalism and good feeling among the members in every way possible.

Section 3. The Committee on Public Welfare shall consist of three members who shall be appointed annually by the President. It shall be its duty to enforce and support the sanitary and medical laws of the state in this county, to cooperate with the Committee on Public Policy and Legislation of the state association in all matters pertaining to legislation, and to prosecute quacks and medical pretenders in this county. The chairman of this committee shall serve as the representative of this Society on the Auxiliary Committee on Public Welfare of the Arizona State Medical Association.

## CHAPTER III.—RIGHTS OF MEMBERS.

Section 1. All members shall be equally privileged to attend all meetings and take part in all proceedings, and shall be eligible to any office or honor with the gift of the Society so long as they conform to this constitution and by-laws, including the payment of dues. A member who is under sentence of suspension or expulsion shall not be permitted to take part in any of the proceedings, or be eligible to any office until relieved of such disability. And, provided further, that none of the privileges of membership shall be extended to any person not a member of this Society except on a majority vote of the Society in regular meeting.

Section 2. A member in good standing who is free from all indebtedness to this Society, and against whom no charges are pending, wishing to withdraw, shall be granted a transfer card. This card shall state the date the member associated himself with this Society, the date of issuance of the card, and shall be signed by the President and Secretary. It shall be accompanied by a copy of the application presented at the time the member joined the Society, for information to the Society to which the member desires to attach himself.

Section 3. A member who is guilty of a criminal offense or of gross misconduct as a citizen, or grossly unethical conduct as a physician, or who violates any of the provisions of the Articles of Incorporation or the By-Laws of the Society, shall be liable to censure, suspension or expulsion. Charges against a member must be made in writing and be delivered to the Secretary, who shall immediately furnish a copy to the accused and to the Chairman of the Board of Censors. The Board of Censors shall investigate the charges on their merits, but no action shall be taken by the Board within ten days of the presentation of the charges to the accused, nor before giving the accused and accusers ample opportunity to be heard. The board shall report (1) that the charges are not sustained; or (2) that the charges are sustained and that the accused be (a) censured; (b) suspended for a definite time, or (c) expelled. Censure or suspension shall require a two-thirds vote of the members present and voting, and a three-fourths vote of those present and voting shall be required to expel a member. No action shall be taken by the Society in such case until at least six weeks have elapsed since the filing of the charges. A member suspended for a definite time shall be reinstated at the expiration of the time.

Section 4. Kindly efforts in the interest of peace, conciliation or reformation, so far as possible and expedient, shall precede the filing of formal charges affecting the character or standing of a member, and the accused shall have opportunity to be heard in his own defense in all trials and proceedings of this nature.

Section 5. Members expelled from this Society for any cause shall be eligible for membership after one year from date of expulsion and on the same terms and in like manner as original applicants.

## CHAPTER IV.—POWERS AND DUTIES.

Section 1. This Society shall have general direction of the affairs of the medical profession of the county, and its influence shall be constantly exerted to better the scientific, material and social condition of every physician within its jurisdiction. Systematic efforts shall be made by each member, and by the Society as a whole, to increase the membership until it embraces every reputable and ethical physician in the county.

Section 2. Regular business and scientific meetings of the Society shall be held on the second and fourth Monday evenings of each month. Fifteen members shall constitute a quorum for the transaction of the business of the Society. Special meetings may be called by the President and shall be called on a written request of ten members. A call for a special meeting shall state the object of such meeting, at which no business except that stated in the call shall be transacted.

The officers and committee on program shall profit by experience and by example of other similar societies, and strive to arrange for the most attractive and successful proceedings for each meeting. Crisp papers and discussions and reports of cases shall be arranged for and encouraged, and tedious and profitless proceedings shall be avoided as far as practicable.

Section 3. Agreements and schedules of fees shall not be made by this Society, but at least one meeting during each year shall be set apart for a discussion of the business and ethical affairs of the profession of the county, with the view of adopting the best methods for the guidance of all. In all

proper ways the public shall be taught that business methods and prompt collections are essential to the equipment of the modern physician and surgeon, and that it suffers even more than the profession when this is not recognized.

Section 4. This Society shall endeavor to educate its members to the belief that the physician should be a leader in his community, in character, in learning, in dignified and manly bearing, and in courteous and open treatment of his brother physicians, to the end that the profession may occupy that place in its own and the public estimation to which it is entitled.

CHAPTER V.—FUNDS AND EXPENSES.

Section 1. The funds of the corporation shall be raised by annual dues in the Society, by special assessments and by voluntary contributions. The annual dues in the Society shall be twenty dollars per year, which includes the annual assessment of the state association. These dues shall not be prorated, except that a member transferring from another county society and who has paid dues in such society for the current year may be required to pay only the annual assessment of the state association for that year. Dues are payable on January 1 of each year, and any member who fails to pay his annual dues by April 1 shall be held as suspended without action on the part of the Society. A member suspended for non-payment of dues shall be restored to full membership on payment of all indebtedness. Members more than one year in arrears shall be dropped from the roll of members.

Section 2. The funds of the Society shall be in charge of the Board of Directors, and may be expended by such Board for such purposes as will promote the welfare of the Society and of the profession. Special assessments may be recommended by the Board of Directors, but shall become binding on the membership only when adopted by majority vote of members present at any regular meeting.

CHAPTER VI.—ORDER OF BUSINESS.

The order of business shall be as follows:

1. Call to order by the President.
2. Reading of the minutes of last meeting.
3. Clinical cases.
4. Papers and discussions.
5. Unfinished business.
6. Miscellaneous business.
7. Announcements.
8. Adjournment.

CHAPTER VII.—RULES OF ORDER.

The deliberations of this Society shall be governed by parliamentary usage as contained in Roberts' Rules of Order, unless otherwise determined by vote.

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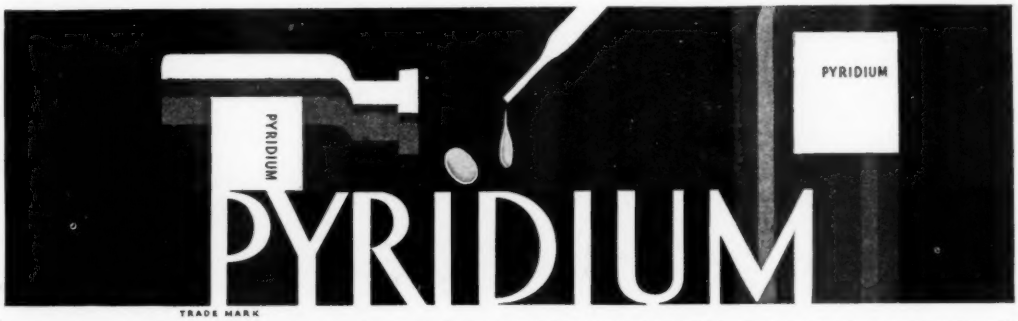

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## CASE OF INTUSSUSCEPTION

(Case Report and Discussions at Staff Meeting of St. Joseph's Hospital held on March 9, 1931.)

### CASE REPORT

**Robert T. Franklin, M.D.**

Case 21814. Mexican boy, age two, admitted to hospital on Feb. 9, 1931.

This case was brought to Dr. Leff's office on the afternoon of Feb. 9, with the following history:

Illness began suddenly 5 days ago with vomiting, bloody diarrhea and pain in abdomen. Vomiting was of the propulsive type, and fecal in character. Was given castor oil on second day of illness without doctor's orders. Condition did not improve and patient was taken to Dr. Leff where I saw him in consultation. Dr. Leff's diagnosis of intussusception was confirmed. Immediate operation was advised.

The past history was negative with exception of double lobar pneumonia in last July and again in November.

Examination showed a well developed, well nourished boy of two years. Upon inspection the patient's general appearance was that of a very sick baby, with anxious expression and dry skin. Temperature 101.2; pulse 118, poor quality; Respiration 28; chest negative; abdomen a large sausage like mass was felt in left abdomen extending from costal margin to brim of pelvis. Abdomen distended and rigid. Examination otherwise negative.

Operation: Left rectus supra-umbilical incision made under ether anesthesia, exposing distended transverse colon which had been pulled to left. Examination showed the intussuscipiens to be transverse and the ascending colon, cecum and appendix as the intussusceptum. This was carefully disinvaginated manually. Serosa appeared to be in good condition as were the vessels. The appendix being enlarged and hyperemic was removed and stump invaginated. Abdomen closed without drainage. Next day the abdomen was quite distended, pulse 140; respiration 40; temperature 100. Examination of chest disclosed many areas of bronchial breathing, rales, etc., characteristic of lobular pneumonia. Patient was put on digitalis and mustard plasters to chest. Caffein-sodio-benzoate. Became gradually worse and died at 8:30 p.m.

### AUTOPSY

Body of a well developed, well nourished male child of two years showing evidence of an incision in the right lower quadrant; operative wound. The thorax and abdomen were opened. Left lung showed marked passive hyperemia of the lower lobe with areas of consolidation in the stage of red hepatization. Similar changes were noted in the right lower lobe. The heart was not enlarged and no gross pathology was found. The liver and kidneys were normal. Spleen showed hyperemia and was slightly enlarged and friable. The cecum showed areas of dark brownish discoloration evidently due to stasis and beginning necrosis. The stump of the appendix was inverted, showed no evidence of leakage. There were small areas of the ileum which were dark in color and showed marked distention. On incision of the cecum and ascending colon the mucous membrane was found injected with a bloody deposit over the surface and multiple areas of beginning necrosis. This extended as far as the first portion of the transverse colon. Stomach was negative.

Bronchopneumonia, bilateral.

Areas of hemorrhage and necrosis in proximal colon and cecum (due to intussusception which had been reduced).

Probably paralytic ileus involving the distal portion of the ileum.

### DISCUSSION

**Thomas W. Woodman, M.D.**

In the particular case under discussion, which was promptly diagnosed and properly handled, there is certainly one feature at least that makes the prognosis more grave than even in the average similar case and that is the fact that this baby had had pneumonia three times within a period of one year and consequently was in marked danger of getting pneumonia again following anesthesia even if the operation was successful.

As has been stated, intussusception most commonly occurs in babies under two years old and more commonly in breast-fed infants. Irritation of the mucous membrane is etiologically important for we often find that intussusception follows a diarrhea. The irritation of the mucous membrane and the resultant diarrhea probably causes increased peristalsis which results in the invagination of the intestine. Castor oil, because of the irregular peristalsis produced, is probably the cause of many of the cases of intussusception.

It has been demonstrated that dysfunction in nervous control, at least experimentally, may be a factor in the production of intussusception. It has been produced in animals by stimulating a segment of the intestine with a faradic current which results in the invagination of the stimulated segment into the relaxed distal portion. This dysfunction in nervous control assists in the explanation of why the majority of the intussusceptions occur in the ileocecal region, for at this point the nervous control changes from a dual supply consisting of sympathetic and parasympathetic supply to the small intestine, to a single nerve supply from the sympathetic system to the large bowel. It is suggested that during rapid peristalsis, which may extend the whole length of the small intestine in a few seconds, the active movement in the small intestine may not be continued by the cecal segment, which is supplied by the sympathetics alone, and intussusception results.

Early diagnosis is of the utmost importance for gangrene of the invaginated portion of the bowel occurs rapidly resulting from the cutting off of blood supply. The onset of the pain is very rapid and the infant will draw up his knees, turn pale, scream because of pain, and vomit. The passage of blood and mucus in the stool is of extreme diagnostic importance but this sign may appear early, (within an hour) or last 12 or 14 hours, or it may not occur at all. A sausage shaped tumor can be palpated in the large percentages of cases. It should always be remembered that acute enterocolitis, which is frequently confused with intussusception, may result in intussusception and we should always be on guard when treating this condition.

The treatment is very definitely surgical and operation should be done as early as possible for gangrene of the invaginated portion of the bowel occurs early. Unless gangrene is present attempt should be made to reduce the invagination by exerting pressure on the apex of the intussusceptum and gentle traction on the gut proximal to the obstruction. Placing a warm towel about the intussusception and even pressure along the bowel will frequently aid in reducing the hemorrhage and swelling so that reduction can be accomplished. Cutting the contracted portion is sometimes neces-

sary, with subsequent closure of the gut. If gangrene has occurred the bowel must be resected.

DR. F. C. JORDAN said he thought the length of time this child had been sick was significant. Five days for any kind of intussusception makes the outlook practically hopeless, no matter how good the general condition may seem to be.

DR. R. J. STROUD recalled the motion picture of the intestines and how they illustrated the ease with which intussusception may occur. It is remarkable that we do not have this condition oftener; the sympathetic nervous system must coordinate the intestinal muscular movements in a wonderful manner. Dr. Franklin made some remarks about using ether anesthesia because the patient could not afford gas. This is a good illustration of the need for a county hospital and just another reason why the medical profession should back the legislation looking toward this devoutly to be desired goal.

DR. O. H. BROWN recalled a case of intussusception in an adult caused by a malignant tumor.

DR. FRANKLIN, in closing said that intestinal polyps is mentioned as a cause of intussusceptino. The amount of intestine involved in this case was interesting; the ascending colon was invaginated into the transverse and the entire mass was in the left side.

## NEW LIGHT ON RICKETS

In the Journal of the American Medical Association, April 4th, 1931, page 100, appears an imposing list of scientific papers on vitamin D, the basis for which is Mead's Viosterol in Oil, 250 D.

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On page 12 of the J. A. M. A. for April 11th, 1931, under the title "Viosterol is not a substitute for cod liver oil except in rickets," is a very interesting statement of the comparative values of viosterol, cod liver oil and 10 D cod liver oil which clarifies the respective advantages of each of these antiricketic agents.

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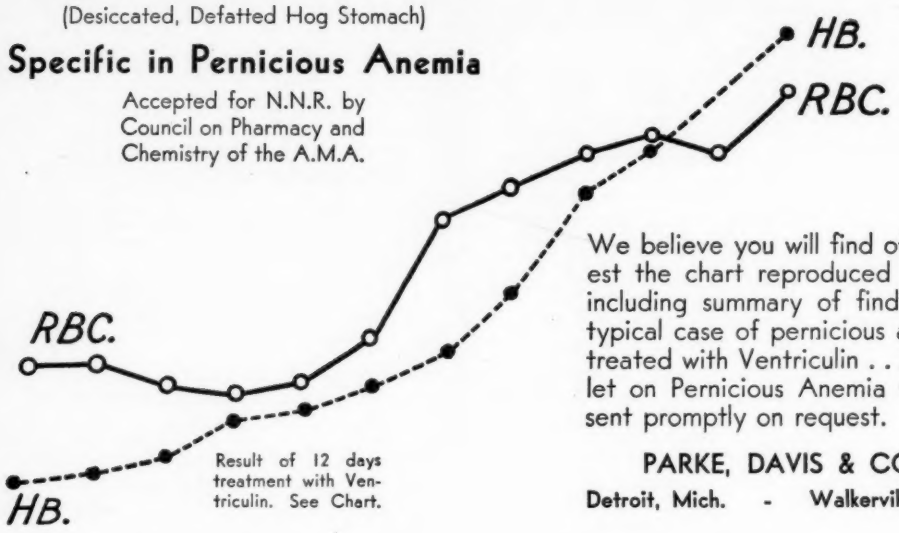


Result of 12 days treatment with Ventriculin. See Chart.

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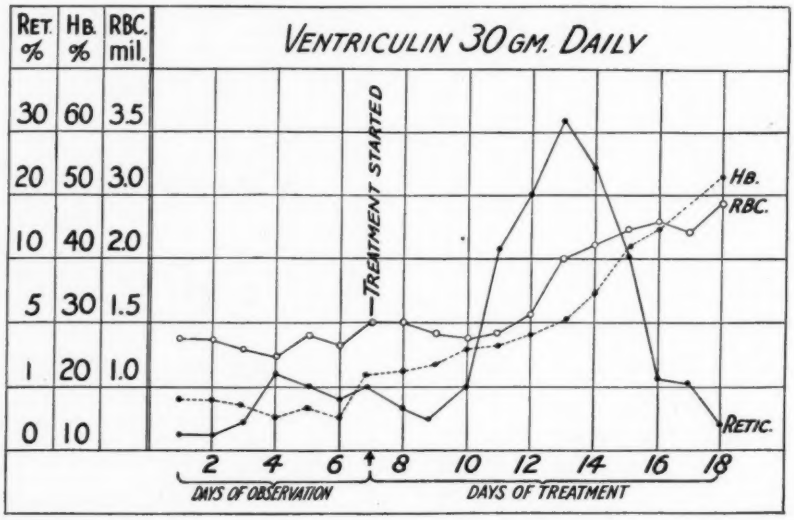


**DIAGNOSIS.** Pernicious anemia.

**INITIAL BLOOD COUNT:** Red blood cells 1.5 million per cu. mm.; Hemoglobin (Newcomer) 21 per cent; Reticulocytes 1.0 per cent.

**TREATMENT.** Ventriculin 30 Gm. daily.

**PHASE OF REMISSION. On sixth day of treatment:** RBC 2.0 million; Hemoglobin (Newcomer) 30 per cent; Reticulocytes 32.0 per cent (calculated rise for 1.5 million red blood cells at beginning of treatment = 22.3 per cent, exceeding expected rise by 9.7 per cent).

**PROGRESS REPORT.** On the twelfth day after Ventriculin was begun the following blood count was recorded: RBC 2.9 million; Hemoglobin 52 per cent; Reticulocytes 0.4 per cent. (Expected weekly increase = 500,000 red blood cells per cu. mm. Actual increase in this patient = 700,000 red blood cells per cu. mm.).